1000 Numerical Problems and Solutions - Physical Chemistry (Undergraduate)

Generated collection across core undergraduate physical chemistry topics. Numerical answers are shown; students can attempt first and then check solutions.

Problem 1: First law ($\Delta U = q + w$)

A system has heat exchange $q = 154$ J (positive means absorbed by system) and work $w = -186$ J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 154 + -186 = -32$ J.

Problem 2: First law ($\Delta U = q + w$)

A system has heat exchange $q = -475$ J (positive means absorbed by system) and work $w = -19$ J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -475 + -19 = -494$ J.

Problem 3: First law ($\Delta U = q + w$)

A system has heat exchange $q = -250$ J (positive means absorbed by system) and work $w = -72$ J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -250 + -72 = -322$ J.

Problem 4: First law ($\Delta U = q + w$)

A system has heat exchange $q = -358$ J (positive means absorbed by system) and work $w = -196$ J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -358 + -196 = -554$ J.

Problem 5: First law ($\Delta U = q + w$)

A system has heat exchange $q = 192$ J (positive means absorbed by system) and work $w = 258$ J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 192 + 258 = 450$ J.

Problem 6: First law (ΔU = q + w)

A system has heat exchange q = -411 J (positive means absorbed by system) and work w = 132 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -411 + 132 = -279 J.

Problem 7: First law (ΔU = q + w)

A system has heat exchange q = -468 J (positive means absorbed by system) and work w = -270 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -468 + -270 = -738 J.

Problem 8: First law (ΔU = q + w)

A system has heat exchange q = -405 J (positive means absorbed by system) and work w = -77 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -405 + -77 = -482 J.

Problem 9: First law (ΔU = q + w)

A system has heat exchange q = -262 J (positive means absorbed by system) and work w = 217 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -262 + 217 = -45 J.

Problem 10: First law (ΔU = q + w)

A system has heat exchange q = 116 J (positive means absorbed by system) and work w = -273 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 116 + -273 = -157 J.

Problem 11: First law (ΔU = q + w)

A system has heat exchange q = 74 J (positive means absorbed by system) and work w = -97 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 74 + -97 = -23 J.

Problem 12: First law (ΔU = q + w)

A system has heat exchange q = 233 J (positive means absorbed by system) and work w = 258 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 233 + 258 = 491$ J.

Problem 13: First law ($\Delta U = q + w$)

A system has heat exchange q = -71 J (positive means absorbed by system) and work w = -75 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -71 + -75 = -146$ J.

Problem 14: First law ($\Delta U = q + w$)

A system has heat exchange q = -41 J (positive means absorbed by system) and work w = -16 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -41 + -16 = -57$ J.

Problem 15: First law ($\Delta U = q + w$)

A system has heat exchange q = 328 J (positive means absorbed by system) and work w = -294 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 328 + -294 = 34$ J.

Problem 16: First law ($\Delta U = q + w$)

A system has heat exchange q = 277 J (positive means absorbed by system) and work w = -137 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 277 + -137 = 140$ J.

Problem 17: First law ($\Delta U = q + w$)

A system has heat exchange q = 214 J (positive means absorbed by system) and work w = 132 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 214 + 132 = 346$ J.

Problem 18: First law ($\Delta U = q + w$)

A system has heat exchange q = -152 J (positive means absorbed by system) and work w = -16 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -152 + -16 = -168$ J.

Problem 19: First law ($\Delta U = q + w$)

A system has heat exchange q = -341 J (positive means absorbed by system) and work w = -80 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -341 + -80 = -421$ J.

Problem 20: First law ($\Delta U = q + w$)

A system has heat exchange q = 480 J (positive means absorbed by system) and work w = 44 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 480 + 44 = 524$ J.

Problem 21: First law ($\Delta U = q + w$)

A system has heat exchange q = -396 J (positive means absorbed by system) and work w = -206 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -396 + -206 = -602$ J.

Problem 22: First law ($\Delta U = q + w$)

A system has heat exchange q = -111 J (positive means absorbed by system) and work w = -201 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -111 + -201 = -312$ J.

Problem 23: First law ($\Delta U = q + w$)

A system has heat exchange q = -133 J (positive means absorbed by system) and work w = 52 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -133 + 52 = -81$ J.

Problem 24: First law ($\Delta U = q + w$)

A system has heat exchange q = 118 J (positive means absorbed by system) and work w = -30 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 118 + -30 = 88$ J.

Problem 25: First law ($\Delta U = q + w$)

A system has heat exchange q = 326 J (positive means absorbed by system) and work w = -256 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 326 + -256 = 70$ J.

Problem 26: First law ($\Delta U = q + w$)

A system has heat exchange q = 247 J (positive means absorbed by system) and work w = 170 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 247 + 170 = 417$ J.

Problem 27: First law ($\Delta U = q + w$)

A system has heat exchange q = 49 J (positive means absorbed by system) and work w = -173 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 49 + -173 = -124$ J.

Problem 28: First law ($\Delta U = q + w$)

A system has heat exchange q = 496 J (positive means absorbed by system) and work w = 87 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 496 + 87 = 583$ J.

Problem 29: First law ($\Delta U = q + w$)

A system has heat exchange q = -420 J (positive means absorbed by system) and work w = 265 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -420 + 265 = -155$ J.

Problem 30: First law ($\Delta U = q + w$)

A system has heat exchange q = -200 J (positive means absorbed by system) and work w = 70 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -200 + 70 = -130$ J.

Problem 31: First law ($\Delta U = q + w$)

A system has heat exchange q = 91 J (positive means absorbed by system) and work w = -104 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 91 + -104 = -13$ J.

Problem 32: First law ($\Delta U = q + w$)

A system has heat exchange q = 221 J (positive means absorbed by system) and work w = -229 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 221 + -229 = -8$ J.

Problem 33: First law ($\Delta U = q + w$)

A system has heat exchange q = -454 J (positive means absorbed by system) and work w = -67 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -454 + -67 = -521$ J.

Problem 34: First law ($\Delta U = q + w$)

A system has heat exchange q = 291 J (positive means absorbed by system) and work w = -4 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 291 + -4 = 287$ J.

Problem 35: First law ($\Delta U = q + w$)

A system has heat exchange q = -419 J (positive means absorbed by system) and work w = -62 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -419 + -62 = -481$ J.

Problem 36: First law ($\Delta U = q + w$)

A system has heat exchange q = 387 J (positive means absorbed by system) and work w = -197 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 387 + -197 = 190$ J.

Problem 37: First law ($\Delta U = q + w$)

A system has heat exchange q = -111 J (positive means absorbed by system) and work w = -16 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -111 + -16 = -127$ J.

Problem 38: First law ($\Delta U = q + w$)

A system has heat exchange q = -36 J (positive means absorbed by system) and work w = 73 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -36 + 73 = 37 J.

Problem 39: First law (ΔU = q + w)

A system has heat exchange q = -334 J (positive means absorbed by system) and work w = 79 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -334 + 79 = -255 J.

Problem 40: First law (ΔU = q + w)

A system has heat exchange q = -137 J (positive means absorbed by system) and work w = -86 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -137 + -86 = -223 J.

Problem 41: First law (ΔU = q + w)

A system has heat exchange q = 186 J (positive means absorbed by system) and work w = -27 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 186 + -27 = 159 J.

Problem 42: First law (ΔU = q + w)

A system has heat exchange q = 218 J (positive means absorbed by system) and work w = -227 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 218 + -227 = -9 J.

Problem 43: First law (ΔU = q + w)

A system has heat exchange q = 123 J (positive means absorbed by system) and work w = -125 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 123 + -125 = -2 J.

Problem 44: First law (ΔU = q + w)

A system has heat exchange q = 46 J (positive means absorbed by system) and work w = -50 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 46 + -50 = -4 J.

Problem 45: First law ($\Delta U = q + w$)

A system has heat exchange q = -333 J (positive means absorbed by system) and work w = 173 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -333 + 173 = -160$ J.

Problem 46: First law ($\Delta U = q + w$)

A system has heat exchange q = -112 J (positive means absorbed by system) and work w = -24 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -112 + -24 = -136$ J.

Problem 47: First law ($\Delta U = q + w$)

A system has heat exchange q = 447 J (positive means absorbed by system) and work w = 270 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 447 + 270 = 717$ J.

Problem 48: First law ($\Delta U = q + w$)

A system has heat exchange q = -276 J (positive means absorbed by system) and work w = 32 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -276 + 32 = -244$ J.

Problem 49: First law ($\Delta U = q + w$)

A system has heat exchange q = 363 J (positive means absorbed by system) and work w = -243 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 363 + -243 = 120$ J.

Problem 50: First law ($\Delta U = q + w$)

A system has heat exchange q = -266 J (positive means absorbed by system) and work w = -268 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -266 + -268 = -534$ J.

Problem 51: First law ($\Delta U = q + w$)

A system has heat exchange q = 324 J (positive means absorbed by system) and work w = 23 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 324 + 23 = 347 J.

Problem 52: First law (ΔU = q + w)

A system has heat exchange q = -90 J (positive means absorbed by system) and work w = -26 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -90 + -26 = -116 J.

Problem 53: First law (ΔU = q + w)

A system has heat exchange q = -433 J (positive means absorbed by system) and work w = -84 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -433 + -84 = -517 J.

Problem 54: First law (ΔU = q + w)

A system has heat exchange q = 435 J (positive means absorbed by system) and work w = 280 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 435 + 280 = 715 J.

Problem 55: First law (ΔU = q + w)

A system has heat exchange q = 397 J (positive means absorbed by system) and work w = 22 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 397 + 22 = 419 J.

Problem 56: First law (ΔU = q + w)

A system has heat exchange q = -283 J (positive means absorbed by system) and work w = 211 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -283 + 211 = -72 J.

Problem 57: First law (ΔU = q + w)

A system has heat exchange q = -95 J (positive means absorbed by system) and work w = 169 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -95 + 169 = 74 J.

Problem 58: First law (ΔU = q + w)

A system has heat exchange q = -354 J (positive means absorbed by system) and work w = -29 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -354 + -29 = -383 J.

Problem 59: First law (ΔU = q + w)

A system has heat exchange q = -358 J (positive means absorbed by system) and work w = -48 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -358 + -48 = -406 J.

Problem 60: First law (ΔU = q + w)

A system has heat exchange q = 262 J (positive means absorbed by system) and work w = 274 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 262 + 274 = 536 J.

Problem 61: First law (ΔU = q + w)

A system has heat exchange q = 51 J (positive means absorbed by system) and work w = -31 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 51 + -31 = 20 J.

Problem 62: First law (ΔU = q + w)

A system has heat exchange q = 264 J (positive means absorbed by system) and work w = 298 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 264 + 298 = 562 J.

Problem 63: First law (ΔU = q + w)

A system has heat exchange q = -62 J (positive means absorbed by system) and work w = 297 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -62 + 297 = 235 J.

Problem 64: First law (ΔU = q + w)

A system has heat exchange q = -92 J (positive means absorbed by system) and work w = 70 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -92 + 70 = -22 J.

Problem 65: First law (ΔU = q + w)

A system has heat exchange q = -276 J (positive means absorbed by system) and work w = -159 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -276 + -159 = -435 J.

Problem 66: First law (ΔU = q + w)

A system has heat exchange q = 21 J (positive means absorbed by system) and work w = 205 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 21 + 205 = 226 J.

Problem 67: First law (ΔU = q + w)

A system has heat exchange q = -407 J (positive means absorbed by system) and work w = -252 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -407 + -252 = -659 J.

Problem 68: First law (ΔU = q + w)

A system has heat exchange q = 381 J (positive means absorbed by system) and work w = -188 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 381 + -188 = 193 J.

Problem 69: First law (ΔU = q + w)

A system has heat exchange q = -344 J (positive means absorbed by system) and work w = -137 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -344 + -137 = -481 J.

Problem 70: First law (ΔU = q + w)

A system has heat exchange q = 311 J (positive means absorbed by system) and work w = 132 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 311 + 132 = 443 J.

Problem 71: First law (ΔU = q + w)

A system has heat exchange q = 110 J (positive means absorbed by system) and work w = -235 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 110 + -235 = -125 J.

Problem 72: First law (ΔU = q + w)

A system has heat exchange q = -106 J (positive means absorbed by system) and work w = 90 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -106 + 90 = -16 J.

Problem 73: First law (ΔU = q + w)

A system has heat exchange q = 110 J (positive means absorbed by system) and work w = 179 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 110 + 179 = 289 J.

Problem 74: First law (ΔU = q + w)

A system has heat exchange q = 41 J (positive means absorbed by system) and work w = -43 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 41 + -43 = -2 J.

Problem 75: First law (ΔU = q + w)

A system has heat exchange q = 494 J (positive means absorbed by system) and work w = 266 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 494 + 266 = 760 J.

Problem 76: First law (ΔU = q + w)

A system has heat exchange q = 381 J (positive means absorbed by system) and work w = -289 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 381 + -289 = 92 J.

Problem 77: First law (ΔU = q + w)

A system has heat exchange q = 196 J (positive means absorbed by system) and work w = -183 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 196 + -183 = 13 J.

Problem 78: First law (ΔU = q + w)

A system has heat exchange q = 198 J (positive means absorbed by system) and work w = 249 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 198 + 249 = 447 J.

Problem 79: First law (ΔU = q + w)

A system has heat exchange q = 268 J (positive means absorbed by system) and work w = -27 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 268 + -27 = 241 J.

Problem 80: First law (ΔU = q + w)

A system has heat exchange q = 287 J (positive means absorbed by system) and work w = 48 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 287 + 48 = 335 J.

Problem 81: First law (ΔU = q + w)

A system has heat exchange q = -386 J (positive means absorbed by system) and work w = 0 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -386 + 0 = -386 J.

Problem 82: First law (ΔU = q + w)

A system has heat exchange q = -55 J (positive means absorbed by system) and work w = -139 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -55 + -139 = -194 J.

Problem 83: First law (ΔU = q + w)

A system has heat exchange q = -36 J (positive means absorbed by system) and work w = -297 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -36 + -297 = -333 J.

Problem 84: First law ($\Delta U = q + w$)

A system has heat exchange q = 476 J (positive means absorbed by system) and work w = -31 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 476 + -31 = 445$ J.

Problem 85: First law ($\Delta U = q + w$)

A system has heat exchange q = 495 J (positive means absorbed by system) and work w = 212 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 495 + 212 = 707$ J.

Problem 86: First law ($\Delta U = q + w$)

A system has heat exchange q = 280 J (positive means absorbed by system) and work w = -118 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 280 + -118 = 162$ J.

Problem 87: First law ($\Delta U = q + w$)

A system has heat exchange q = 19 J (positive means absorbed by system) and work w = -192 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 19 + -192 = -173$ J.

Problem 88: First law ($\Delta U = q + w$)

A system has heat exchange q = 391 J (positive means absorbed by system) and work w = 5 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 391 + 5 = 396$ J.

Problem 89: First law ($\Delta U = q + w$)

A system has heat exchange q = 361 J (positive means absorbed by system) and work w = 219 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 361 + 219 = 580$ J.

Problem 90: First law ($\Delta U = q + w$)

A system has heat exchange q = 123 J (positive means absorbed by system) and work w = -97 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 123 + -97 = 26$ J.

Problem 91: First law ($\Delta U = q + w$)

A system has heat exchange q = -344 J (positive means absorbed by system) and work w = 82 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = -344 + 82 = -262$ J.

Problem 92: First law ($\Delta U = q + w$)

A system has heat exchange q = 280 J (positive means absorbed by system) and work w = -135 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 280 + -135 = 145$ J.

Problem 93: First law ($\Delta U = q + w$)

A system has heat exchange q = 52 J (positive means absorbed by system) and work w = 243 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 52 + 243 = 295$ J.

Problem 94: First law ($\Delta U = q + w$)

A system has heat exchange q = 440 J (positive means absorbed by system) and work w = -300 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 440 + -300 = 140$ J.

Problem 95: First law ($\Delta U = q + w$)

A system has heat exchange q = 113 J (positive means absorbed by system) and work w = 31 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 113 + 31 = 144$ J.

Problem 96: First law ($\Delta U = q + w$)

A system has heat exchange q = 0 J (positive means absorbed by system) and work w = -281 J (positive when done on the system). Calculate ΔU.

Solution:

$\Delta U = q + w = 0 + -281 = -281$ J.

Problem 97: First law (ΔU = q + w)

A system has heat exchange q = -386 J (positive means absorbed by system) and work w = 71 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -386 + 71 = -315 J.

Problem 98: First law (ΔU = q + w)

A system has heat exchange q = 399 J (positive means absorbed by system) and work w = 14 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = 399 + 14 = 413 J.

Problem 99: First law (ΔU = q + w)

A system has heat exchange q = -255 J (positive means absorbed by system) and work w = -241 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -255 + -241 = -496 J.

Problem 100: First law (ΔU = q + w)

A system has heat exchange q = -254 J (positive means absorbed by system) and work w = 280 J (positive when done on the system). Calculate ΔU.

Solution:

ΔU = q + w = -254 + 280 = 26 J.

Problem 101: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 10.0 L to 43.01 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×273×ln(43.01/10.0) = -1655.68 J.

Problem 102: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 47.98 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×298×ln(47.98/10.0) = -3885.54 J.

Problem 103: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 48.65 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -1×8.314×300×\ln(48.65/10.0) = -3946.21$ J.

Problem 104: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 49.82 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -1×8.314×300×\ln(49.82/10.0) = -4005.49$ J.

Problem 105: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 16.6 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -2×8.314×320×\ln(16.6/10.0) = -2696.91$ J.

Problem 106: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 5.0 L to 6.4 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -1×8.314×273×\ln(6.4/5.0) = -560.33$ J.

Problem 107: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 350 K from 2.0 L to 2.45 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -1×8.314×350×\ln(2.45/2.0) = -590.57$ J.

Problem 108: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 298 K from 1.0 L to 4.64 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -0.5×8.314×298×\ln(4.64/1.0) = -1901.29$ J.

Problem 109: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 273 K from 2.0 L to 4.52 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(V_f/V_i) = -2×8.314×273×\ln(4.52/2.0) = -3701.51$ J.

Problem 110: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 2.0 L to 7.9 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×298×ln(7.9/2.0) = -10211.01 J.

Problem 111: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 42.68 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×298×ln(42.68/10.0) = -10786.55 J.

Problem 112: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 1.0 L to 3.7 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×273×ln(3.7/1.0) = -2969.72 J.

Problem 113: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 29.75 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×320×ln(29.75/10.0) = -5801.47 J.

Problem 114: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 1.0 L to 2.73 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×273×ln(2.73/1.0) = -1139.81 J.

Problem 115: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 273 K from 2.0 L to 3.86 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×273×ln(3.86/2.0) = -2984.94 J.

Problem 116: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 18.97 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -3\times8.314\times298\times\ln(18.97/10.0) = -4759.24$ J.

Problem 117: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 1.0 L to 2.88 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -3\times8.314\times298\times\ln(2.88/1.0) = -7862.69$ J.

Problem 118: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 1.0 L to 4.88 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -0.5\times8.314\times273\times\ln(4.88/1.0) = -1799.02$ J.

Problem 119: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 30.45 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -1\times8.314\times298\times\ln(30.45/10.0) = -2758.93$ J.

Problem 120: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 1.0 L to 1.83 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -1\times8.314\times320\times\ln(1.83/1.0) = -1607.86$ J.

Problem 121: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 320 K from 5.0 L to 23.6 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -0.5\times8.314\times320\times\ln(23.6/5.0) = -2064.39$ J.

Problem 122: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 38.47 L. Calculate work done on the system (in J).

Solution:

$w = -nRT\ \ln(Vf/Vi) = -3\times8.314\times300\times\ln(38.47/10.0) = -10081.82$ J.

Problem 123: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 2.0 L to 4.65 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×298×ln(4.65/2.0) = -6271.48 J.

Problem 124: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 4.04 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×350×ln(4.04/1.0) = -2031.58 J.

Problem 125: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 10.0 L to 31.11 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×273×ln(31.11/10.0) = -1288.08 J.

Problem 126: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 1.0 L to 4.44 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×273×ln(4.44/1.0) = -3383.56 J.

Problem 127: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 3.77 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×350×ln(3.77/1.0) = -1930.94 J.

Problem 128: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 1.0 L to 4.78 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×320×ln(4.78/1.0) = -4162.39 J.

Problem 129: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 3.55 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×350×ln(3.55/1.0) = -3686.90 J.

Problem 130: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 350 K from 5.0 L to 23.76 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×350×ln(23.76/5.0) = -13606.57 J.

Problem 131: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 2.0 L to 4.42 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×300×ln(4.42/2.0) = -1977.99 J.

Problem 132: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 24.01 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×300×ln(24.01/10.0) = -2184.75 J.

Problem 133: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 10.0 L to 35.6 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×273×ln(35.6/10.0) = -1441.08 J.

Problem 134: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 2.0 L to 6.24 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×273×ln(6.24/2.0) = -1291.35 J.

Problem 135: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 1.0 L to 4.54 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×300×ln(4.54/1.0) = -3773.75 J.

Problem 136: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 300 K from 2.0 L to 5.73 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×300×ln(5.73/2.0) = -5250.92 J.

Problem 137: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 3.74 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×350×ln(3.74/1.0) = -7677.24 J.

Problem 138: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 273 K from 2.0 L to 4.41 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×273×ln(4.41/2.0) = -3589.66 J.

Problem 139: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 350 K from 2.0 L to 4.47 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×350×ln(4.47/2.0) = -1170.20 J.

Problem 140: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 2.0 L to 7.62 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×300×ln(7.62/2.0) = -3336.50 J.

Problem 141: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 350 K from 10.0 L to 21.54 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×350×ln(21.54/10.0) = -4465.94 J.

Problem 142: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 10.0 L to 43.52 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -0.5×8.314×273×\ln(43.52/10.0) = -1669.06$ J.

Problem 143: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 5.0 L to 20.65 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -0.5×8.314×273×\ln(20.65/5.0) = -1609.64$ J.

Problem 144: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 32.96 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2×8.314×298×\ln(32.96/10.0) = -5910.38$ J.

Problem 145: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 1.63 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -3×8.314×350×\ln(1.63/1.0) = -4265.39$ J.

Problem 146: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 4.37 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -1×8.314×350×\ln(4.37/1.0) = -4291.65$ J.

Problem 147: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 2.0 L to 2.72 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -1×8.314×320×\ln(2.72/2.0) = -818.10$ J.

Problem 148: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 273 K from 5.0 L to 9.99 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2×8.314×273×\ln(9.99/5.0) = -3142.14$ J.

Problem 149: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 5.0 L to 20.82 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×273×ln(20.82/5.0) = -3237.88 J.

Problem 150: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 350 K from 2.0 L to 9.44 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×350×ln(9.44/2.0) = -13547.58 J.

Problem 151: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 2.0 L to 9.1 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×298×ln(9.1/2.0) = -3754.05 J.

Problem 152: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 298 K from 5.0 L to 20.87 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×298×ln(20.87/5.0) = -1770.17 J.

Problem 153: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 5.0 L to 9.02 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×298×ln(9.02/5.0) = -4385.59 J.

Problem 154: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 320 K from 1.0 L to 4.46 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×320×ln(4.46/1.0) = -1989.02 J.

Problem 155: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 25.29 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -1×8.314×298×\ln(25.29/10.0) = -2298.88$ J.

Problem 156: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 1.0 L to 3.71 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -1×8.314×298×\ln(3.71/1.0) = -3248.36$ J.

Problem 157: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 300 K from 5.0 L to 22.42 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -3×8.314×300×\ln(22.42/5.0) = -11228.38$ J.

Problem 158: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 37.82 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2×8.314×300×\ln(37.82/10.0) = -6636.20$ J.

Problem 159: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 273 K from 1.0 L to 4.53 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2×8.314×273×\ln(4.53/1.0) = -6858.22$ J.

Problem 160: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 298 K from 5.0 L to 6.73 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2×8.314×298×\ln(6.73/5.0) = -1472.44$ J.

Problem 161: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 300 K from 5.0 L to 14.29 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -3×8.314×300×\ln(14.29/5.0) = -7858.08$ J.

Problem 162: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 320 K from 2.0 L to 4.34 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×320×ln(4.34/2.0) = -1030.63 J.

Problem 163: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 273 K from 2.0 L to 5.17 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×273×ln(5.17/2.0) = -6467.20 J.

Problem 164: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 300 K from 5.0 L to 18.6 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×300×ln(18.6/5.0) = -1638.44 J.

Problem 165: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 300 K from 5.0 L to 18.67 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×300×ln(18.67/5.0) = -1643.12 J.

Problem 166: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 5.0 L to 16.53 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×320×ln(16.53/5.0) = -6362.83 J.

Problem 167: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 37.74 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×320×ln(37.74/10.0) = -3533.67 J.

Problem 168: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 350 K from 5.0 L to 13.72 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×350×ln(13.72/5.0) = -2937.47 J.

Problem 169: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 300 K from 5.0 L to 9.99 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×300×ln(9.99/5.0) = -863.22 J.

Problem 170: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 28.8 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×320×ln(28.8/10.0) = -5628.77 J.

Problem 171: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 350 K from 10.0 L to 42.16 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×350×ln(42.16/10.0) = -4187.25 J.

Problem 172: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 5.0 L to 15.79 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×273×ln(15.79/5.0) = -2610.19 J.

Problem 173: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 273 K from 2.0 L to 7.51 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×273×ln(7.51/2.0) = -6006.42 J.

Problem 174: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 2.0 L to 2.59 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×298×ln(2.59/2.0) = -640.51 J.

Problem 175: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 1.0 L to 2.93 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×320×ln(2.93/1.0) = -2860.18 J.

Problem 176: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 27.19 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×320×ln(27.19/10.0) = -2661.33 J.

Problem 177: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 1.0 L to 4.16 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×273×ln(4.16/1.0) = -3235.70 J.

Problem 178: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 13.91 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×298×ln(13.91/10.0) = -817.70 J.

Problem 179: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 273 K from 10.0 L to 17.07 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×273×ln(17.07/10.0) = -1213.77 J.

Problem 180: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 350 K from 5.0 L to 24.05 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×350×ln(24.05/5.0) = -13712.48 J.

Problem 181: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 350 K from 10.0 L to 43.56 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-3\times8.314\times350\times\ln(43.56/10.0)$ = -12846.94 J.

Problem 182: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 29.1 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-3\times8.314\times298\times\ln(29.1/10.0)$ = -7939.72 J.

Problem 183: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 35.82 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-1\times8.314\times300\times\ln(35.82/10.0)$ = -3182.58 J.

Problem 184: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 1.0 L to 3.91 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-2\times8.314\times320\times\ln(3.91/1.0)$ = -7255.73 J.

Problem 185: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 300 K from 5.0 L to 12.07 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-1\times8.314\times300\times\ln(12.07/5.0)$ = -2198.22 J.

Problem 186: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 298 K from 2.0 L to 4.16 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-0.5\times8.314\times298\times\ln(4.16/2.0)$ = -907.30 J.

Problem 187: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 298 K from 1.0 L to 2.78 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = $-1\times8.314\times298\times\ln(2.78/1.0)$ = -2533.34 J.

Problem 188: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 350 K from 10.0 L to 27.8 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2\times8.314\times350\times\ln(27.8/10.0) = -5950.79$ J.

Problem 189: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 46.38 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -1\times8.314\times320\times\ln(46.38/10.0) = -4082.16$ J.

Problem 190: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 350 K from 10.0 L to 30.13 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -0.5\times8.314\times350\times\ln(30.13/10.0) = -1604.81$ J.

Problem 191: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 44.43 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2\times8.314\times300\times\ln(44.43/10.0) = -7439.76$ J.

Problem 192: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 350 K from 2.0 L to 6.11 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -3\times8.314\times350\times\ln(6.11/2.0) = -9749.69$ J.

Problem 193: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 10.0 L to 13.1 L. Calculate work done on the system (in J).

Solution:

$w = -nRT \ln(Vf/Vi) = -2\times8.314\times320\times\ln(13.1/10.0) = -1436.88$ J.

Problem 194: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 320 K from 2.0 L to 8.79 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×320×ln(8.79/2.0) = -7877.95 J.

Problem 195: Isothermal reversible expansion (work)

1 mol of an ideal gas expands reversibly and isothermally at 350 K from 1.0 L to 4.65 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -1×8.314×350×ln(4.65/1.0) = -4472.38 J.

Problem 196: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 273 K from 10.0 L to 17.16 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×273×ln(17.16/10.0) = -612.85 J.

Problem 197: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 298 K from 1.0 L to 2.19 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×298×ln(2.19/1.0) = -5826.84 J.

Problem 198: Isothermal reversible expansion (work)

2 mol of an ideal gas expands reversibly and isothermally at 298 K from 10.0 L to 24.42 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -2×8.314×298×ln(24.42/10.0) = -4424.28 J.

Problem 199: Isothermal reversible expansion (work)

3 mol of an ideal gas expands reversibly and isothermally at 300 K from 10.0 L to 21.59 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -3×8.314×300×ln(21.59/10.0) = -5759.27 J.

Problem 200: Isothermal reversible expansion (work)

0.5 mol of an ideal gas expands reversibly and isothermally at 320 K from 1.0 L to 4.05 L. Calculate work done on the system (in J).

Solution:

w = -nRT ln(Vf/Vi) = -0.5×8.314×320×ln(4.05/1.0) = -1860.73 J.

Problem 201: ΔG° ⟷ K

Standard Gibbs free energy change $\Delta G° = -107.50$ kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

$\Delta G° = -RT \ln K \rightarrow \ln K = -\Delta G°/(RT) = 107499.45/(8.31446261815324 \times 300) = 43.0974 \rightarrow K = \exp(...) = 5.2114e+18$.

Problem 202: ΔG° ⟷ K

Standard Gibbs free energy change $\Delta G° = -66.19$ kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

$\Delta G° = -RT \ln K \rightarrow \ln K = -\Delta G°/(RT) = 66186.68/(8.31446261815324 \times 273) = 29.1591 \rightarrow K = \exp(...) = 4.6092e+12$.

Problem 203: ΔG° ⟷ K

Standard Gibbs free energy change $\Delta G° = 67.50$ kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

$\Delta G° = -RT \ln K \rightarrow \ln K = -\Delta G°/(RT) = -67495.93/(8.31446261815324 \times 273) = -29.7359 \rightarrow K = \exp(...) = 1.2186e-13$.

Problem 204: ΔG° ⟷ K

Standard Gibbs free energy change $\Delta G° = 61.02$ kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

$\Delta G° = -RT \ln K \rightarrow \ln K = -\Delta G°/(RT) = -61015.97/(8.31446261815324 \times 298) = -24.6260 \rightarrow K = \exp(...) = 2.0188e-11$.

Problem 205: ΔG° ⟷ K

Standard Gibbs free energy change $\Delta G° = -72.15$ kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

$\Delta G° = -RT \ln K \rightarrow \ln K = -\Delta G°/(RT) = 72153.44/(8.31446261815324 \times 273) = 31.7878 \rightarrow K = \exp(...) = 6.3864e+13$.

Problem 206: ΔG° ⟷ K

Standard Gibbs free energy change $\Delta G° = 29.12$ kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -29120.56/(8.31446261815324×298) = -11.7530 → K = exp(...) = 7.8656e-06.

Problem 207: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -89.71 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 89706.97/(8.31446261815324×273) = 39.5211 → K = exp(...) = 1.4582e+17.

Problem 208: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 15.35 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -15352.70/(8.31446261815324×298) = -6.1963 → K = exp(...) = 2.0369e-03.

Problem 209: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -8.39 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 8391.84/(8.31446261815324×300) = 3.3644 → K = exp(...) = 2.8915e+01.

Problem 210: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 64.06 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -64055.54/(8.31446261815324×298) = -25.8527 → K = exp(...) = 5.9198e-12.

Problem 211: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 25.41 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -25414.25/(8.31446261815324×273) = -11.1965 → K = exp(...) = 1.3723e-05.

Problem 212: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 66.67 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -66670.05/(8.31446261815324×298) = -26.9079 → K = exp(...) = 2.0608e-12.

Problem 213: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 111.53 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -111532.99/(8.31446261815324×273) = -49.1368 → K = exp(...) = 4.5727e-22.

Problem 214: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 18.88 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -18884.34/(8.31446261815324×300) = -7.5709 → K = exp(...) = 5.1524e-04.

Problem 215: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 18.19 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -18191.21/(8.31446261815324×310) = -7.0577 → K = exp(...) = 8.6072e-04.

Problem 216: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -24.80 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 24802.93/(8.31446261815324×298) = 10.0104 → K = exp(...) = 2.2257e+04.

Problem 217: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -101.76 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 101760.85/(8.31446261815324×298) = 41.0705 → K = exp(...) = 6.8660e+17.

Problem 218: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -95.54 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 95543.69/(8.31446261815324×300) = 38.3042 → K = exp(...) = 4.3183e+16.

Problem 219: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 84.07 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -84070.38/(8.31446261815324×350) = -28.8895 → K = exp(...) = 2.8407e-13.

Problem 220: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 73.33 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -73326.71/(8.31446261815324×350) = -25.1976 → K = exp(...) = 1.1397e-11.

Problem 221: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 67.83 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -67832.48/(8.31446261815324×300) = -27.1946 → K = exp(...) = 1.5472e-12.

Problem 222: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 7.86 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -7858.86/(8.31446261815324×300) = -3.1507 → K = exp(...) = 4.2823e-02.

Problem 223: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -103.45 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 103450.38/(8.31446261815324×300) = 41.4741 → K = exp(...) = 1.0279e+18.

Problem 224: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -116.96 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 116963.48/(8.31446261815324×310) = 45.3789 → K = exp(...) = 5.1030e+19.

Problem 225: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 77.36 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -77359.42/(8.31446261815324×273) = -34.0813 → K = exp(...) = 1.5801e-15.

Problem 226: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -15.95 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 15954.38/(8.31446261815324×300) = 6.3962 → K = exp(...) = 5.9958e+02.

Problem 227: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 32.54 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -32540.43/(8.31446261815324×310) = -12.6249 → K = exp(...) = 3.2891e-06.

Problem 228: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 49.75 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -49754.07/(8.31446261815324×310) = -19.3034 → K = exp(...) = 4.1368e-09.

Problem 229: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -77.73 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 77727.13/(8.31446261815324×350) = 26.7098 → K = exp(...) = 3.9803e+11.

Problem 230: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 111.71 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -111713.70/(8.31446261815324×300) = -44.7869 → K = exp(...) = 3.5424e-20.

Problem 231: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 27.82 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -27818.96/(8.31446261815324×350) = -9.5596 → K = exp(...) = 7.0523e-05.

Problem 232: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 65.91 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -65913.95/(8.31446261815324×310) = -25.5730 → K = exp(...) = 7.8306e-12.

Problem 233: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -15.46 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 15462.12/(8.31446261815324×350) = 5.3133 → K = exp(...) = 2.0303e+02.

Problem 234: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -55.59 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 55585.07/(8.31446261815324×298) = 22.4341 → K = exp(...) = 5.5333e+09.

Problem 235: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 79.38 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -79375.44/(8.31446261815324×273) = -34.9695 → K = exp(...) = 6.5004e-16.

Problem 236: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -53.06 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 53057.22/(8.31446261815324×310) = 20.5849 → K = exp(...) = 8.7077e+08.

Problem 237: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -61.47 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 61472.77/(8.31446261815324×310) = 23.8499 → K = exp(...) = 2.2798e+10.

Problem 238: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 16.76 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -16763.91/(8.31446261815324×310) = -6.5040 → K = exp(...) = 1.4975e-03.

Problem 239: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -39.26 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 39264.81/(8.31446261815324×310) = 15.2338 → K = exp(...) = 4.1300e+06.

Problem 240: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 84.23 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -84228.68/(8.31446261815324×298) = -33.9946 → K = exp(...) = 1.7232e-15.

Problem 241: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -2.99 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 2988.02/(8.31446261815324×300) = 1.1979 → K = exp(...) = 3.3132e+00.

Problem 242: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 71.48 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -71479.77/(8.31446261815324×300) = -28.6568 → K = exp(...) = 3.5852e-13.

Problem 243: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -52.88 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 52881.96/(8.31446261815324×350) = 18.1721 → K = exp(...) = 7.7991e+07.

Problem 244: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 48.28 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -48284.10/(8.31446261815324×300) = -19.3575 → K = exp(...) = 3.9188e-09.

Problem 245: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 13.39 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -13389.85/(8.31446261815324×350) = -4.6012 → K = exp(...) = 1.0040e-02.

Problem 246: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 107.54 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -107535.02/(8.31446261815324×273) = -47.3754 → K = exp(...) = 2.6614e-21.

Problem 247: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -62.07 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 62074.55/(8.31446261815324×310) = 24.0834 → K = exp(...) = 2.8793e+10.

Problem 248: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -2.74 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 2741.32/(8.31446261815324×298) = 1.1064 → K = exp(...) = 3.0234e+00.

Problem 249: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 45.75 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -45746.24/(8.31446261815324×310) = -17.7484 → K = exp(...) = 1.9587e-08.

Problem 250: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -12.44 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 12438.11/(8.31446261815324×273) = 5.4797 → K = exp(...) = 2.3978e+02.

Problem 251: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -97.67 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 97667.20/(8.31446261815324×298) = 39.4183 → K = exp(...) = 1.3157e+17.

Problem 252: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -22.94 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 22943.73/(8.31446261815324×298) = 9.2601 → K = exp(...) = 1.0510e+04.

Problem 253: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -46.51 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 46510.55/(8.31446261815324×350) = 15.9827 → K = exp(...) = 8.7334e+06.

Problem 254: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -31.44 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 31435.09/(8.31446261815324×350) = 10.8022 → K = exp(...) = 4.9129e+04.

Problem 255: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 7.42 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -7421.26/(8.31446261815324×310) = -2.8793 → K = exp(...) = 5.6176e-02.

Problem 256: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 119.19 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -119191.55/(8.31446261815324×350) = -40.9584 → K = exp(...) = 1.6292e-18.

Problem 257: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -40.61 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 40610.09/(8.31446261815324×310) = 15.7557 → K = exp(...) = 6.9602e+06.

Problem 258: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -54.98 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 54980.06/(8.31446261815324×300) = 22.0419 → K = exp(...) = 3.7384e+09.

Problem 259: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -64.67 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 64670.87/(8.31446261815324×298) = 26.1011 → K = exp(...) = 2.1655e+11.

Problem 260: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -44.27 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 44268.49/(8.31446261815324×350) = 15.2122 → K = exp(...) = 4.0419e+06.

Problem 261: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 108.21 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -108210.61/(8.31446261815324×298) = -43.6736 → K = exp(...) = 1.0784e-19.

Problem 262: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -74.03 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 74030.17/(8.31446261815324×310) = 28.7219 → K = exp(...) = 2.9768e+12.

Problem 263: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -53.64 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 53640.09/(8.31446261815324×350) = 18.4326 → K = exp(...) = 1.0120e+08.

Problem 264: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 114.39 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -114385.69/(8.31446261815324×350) = -39.3070 → K = exp(...) = 8.4958e-18.

Problem 265: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 23.23 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -23229.78/(8.31446261815324×273) = -10.2341 → K = exp(...) = 3.5925e-05.

Problem 266: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 79.83 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -79830.81/(8.31446261815324×300) = -32.0048 → K = exp(...) = 1.2604e-14.

Problem 267: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -65.40 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 65404.04/(8.31446261815324×298) = 26.3970 → K = exp(...) = 2.9111e+11.

Problem 268: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -47.46 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 47455.78/(8.31446261815324×350) = 16.3075 → K = exp(...) = 1.2085e+07.

Problem 269: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -89.62 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 89620.09/(8.31446261815324×273) = 39.4829 → K = exp(...) = 1.4034e+17.

Problem 270: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 113.83 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -113830.78/(8.31446261815324×350) = -39.1163 → K = exp(...) = 1.0281e-17.

Problem 271: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -49.89 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 49887.21/(8.31446261815324×298) = 20.1344 → K = exp(...) = 5.5496e+08.

Problem 272: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 33.09 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -33088.72/(8.31446261815324×310) = -12.8376 → K = exp(...) = 2.6589e-06.

Problem 273: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -95.38 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 95378.96/(8.31446261815324×273) = 42.0200 → K = exp(...) = 1.7744e+18.

Problem 274: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 17.78 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -17775.41/(8.31446261815324×310) = -6.8964 → K = exp(...) = 1.0114e-03.

Problem 275: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -5.11 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 5108.59/(8.31446261815324×300) = 2.0481 → K = exp(...) = 7.7530e+00.

Problem 276: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -75.75 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 75752.72/(8.31446261815324×273) = 33.3735 → K = exp(...) = 3.1183e+14.

Problem 277: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -59.41 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 59405.19/(8.31446261815324×310) = 23.0477 → K = exp(...) = 1.0221e+10.

Problem 278: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -92.62 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 92619.09/(8.31446261815324×273) = 40.8041 → K = exp(...) = 5.2600e+17.

Problem 279: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -23.83 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 23830.21/(8.31446261815324×273) = 10.4986 → K = exp(...) = 3.6264e+04.

Problem 280: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 18.49 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -18485.08/(8.31446261815324×273) = -8.1438 → K = exp(...) = 2.9055e-04.

Problem 281: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = -83.59 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 83585.52/(8.31446261815324×350) = 28.7229 → K = exp(...) = 2.9800e+12.

Problem 282: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 107.79 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -107790.15/(8.31446261815324×273) = -47.4878 → K = exp(...) = 2.3785e-21.

Problem 283: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 118.54 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -118540.35/(8.31446261815324×273) = -52.2239 → K = exp(...) = 2.0866e-23.

Problem 284: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 13.94 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -13937.53/(8.31446261815324×310) = -5.4074 → K = exp(...) = 4.4832e-03.

Problem 285: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 25.52 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -25516.24/(8.31446261815324×350) = -8.7683 → K = exp(...) = 1.5559e-04.

Problem 286: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -65.84 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 65835.09/(8.31446261815324×350) = 22.6233 → K = exp(...) = 6.6859e+09.

Problem 287: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -28.71 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 28709.27/(8.31446261815324×310) = 11.1385 → K = exp(...) = 6.8768e+04.

Problem 288: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -48.64 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 48635.25/(8.31446261815324×350) = 16.7128 → K = exp(...) = 1.8125e+07.

Problem 289: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 117.61 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -117607.50/(8.31446261815324×300) = -47.1498 → K = exp(...) = 3.3351e-21.

Problem 290: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 16.47 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -16471.07/(8.31446261815324×273) = -7.2565 → K = exp(...) = 7.0560e-04.

Problem 291: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 26.31 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -26311.42/(8.31446261815324×273) = -11.5917 → K = exp(...) = 9.2424e-06.

Problem 292: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 107.42 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -107421.65/(8.31446261815324×298) = -43.3552 → K = exp(...) = 1.4828e-19.

Problem 293: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 30.12 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -30123.61/(8.31446261815324×300) = -12.0768 → K = exp(...) = 5.6901e-06.

Problem 294: ΔG° ⟷ K

Standard Gibbs free energy change ΔG° = 38.50 kJ/mol at 298 K. Calculate equilibrium constant K.

Solution:
ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -38502.75/(8.31446261815324×298) = -15.5397 → K = exp(...) = 1.7833e-07.

Problem 295: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -62.43 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:
ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 62432.36/(8.31446261815324×350) = 21.4540 → K = exp(...) = 2.0765e+09.

Problem 296: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -101.98 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:
ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 101984.43/(8.31446261815324×273) = 44.9301 → K = exp(...) = 3.2575e+19.

Problem 297: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -21.96 kJ/mol at 350 K. Calculate equilibrium constant K.

Solution:
ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 21955.78/(8.31446261815324×350) = 7.5448 → K = exp(...) = 1.8909e+03.

Problem 298: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -7.22 kJ/mol at 273 K. Calculate equilibrium constant K.

Solution:
ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 7221.01/(8.31446261815324×273) = 3.1813 → K = exp(...) = 2.4077e+01.

Problem 299: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = -64.45 kJ/mol at 300 K. Calculate equilibrium constant K.

Solution:
ΔG° = -RT ln K → ln K = -ΔG°/(RT) = 64445.70/(8.31446261815324×300) = 25.8368 → K = exp(...) = 1.6625e+11.

Problem 300: ΔG° ↔ K

Standard Gibbs free energy change ΔG° = 48.72 kJ/mol at 310 K. Calculate equilibrium constant K.

Solution:

ΔG° = -RT ln K → ln K = -ΔG°/(RT) = -48717.01/(8.31446261815324×310) = -18.9010 → K = exp(...) = 6.1859e-09.

Problem 301: First-order kinetics

A first-order reaction has rate constant k = 0.01516 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.01516 = 45.72 s. Time for 10% remaining = -ln(0.1)/k = 151.89 s.

Problem 302: First-order kinetics

A first-order reaction has rate constant k = 0.18486 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.18486 = 3.75 s. Time for 10% remaining = -ln(0.1)/k = 12.46 s.

Problem 303: First-order kinetics

A first-order reaction has rate constant k = 0.0856 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.0856 = 8.10 s. Time for 10% remaining = -ln(0.1)/k = 26.90 s.

Problem 304: First-order kinetics

A first-order reaction has rate constant k = 0.12988 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12988 = 5.34 s. Time for 1% remaining = -ln(0.01)/k = 35.46 s.

Problem 305: First-order kinetics

A first-order reaction has rate constant k = 0.1655 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.1655 = 4.19 s. Time for 50% remaining = -ln(0.5)/k = 4.19 s.

Problem 306: First-order kinetics

A first-order reaction has rate constant k = 0.01287 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.01287 = 53.86 s. Time for 1% remaining = -ln(0.01)/k = 357.82 s.

Problem 307: First-order kinetics

A first-order reaction has rate constant k = 0.11941 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.11941 = 5.80 s. Time for 1% remaining = -ln(0.01)/k = 38.57 s.

Problem 308: First-order kinetics

A first-order reaction has rate constant k = 0.08839 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08839 = 7.84 s. Time for 20% remaining = -ln(0.2)/k = 18.21 s.

Problem 309: First-order kinetics

A first-order reaction has rate constant k = 0.13805 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.13805 = 5.02 s. Time for 20% remaining = -ln(0.2)/k = 11.66 s.

Problem 310: First-order kinetics

A first-order reaction has rate constant k = 0.18859 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.18859 = 3.68 s. Time for 20% remaining = -ln(0.2)/k = 8.53 s.

Problem 311: First-order kinetics

A first-order reaction has rate constant k = 0.08811 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08811 = 7.87 s. Time for 50% remaining = -ln(0.5)/k = 7.87 s.

Problem 312: First-order kinetics

A first-order reaction has rate constant k = 0.178 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.178 = 3.89 s. Time for 1% remaining = -ln(0.01)/k = 25.87 s.

Problem 313: First-order kinetics

A first-order reaction has rate constant k = 0.12114 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12114 = 5.72 s. Time for 50% remaining = -ln(0.5)/k = 5.72 s.

Problem 314: First-order kinetics

A first-order reaction has rate constant k = 0.01917 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.01917 = 36.16 s. Time for 50% remaining = -ln(0.5)/k = 36.16 s.

Problem 315: First-order kinetics

A first-order reaction has rate constant k = 0.19991 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.19991 = 3.47 s. Time for 1% remaining = -ln(0.01)/k = 23.04 s.

Problem 316: First-order kinetics

A first-order reaction has rate constant k = 0.11567 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.11567 = 5.99 s. Time for 10% remaining = -ln(0.1)/k = 19.91 s.

Problem 317: First-order kinetics

A first-order reaction has rate constant k = 0.09463 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.09463 = 7.32 s. Time for 20% remaining = -ln(0.2)/k = 17.01 s.

Problem 318: First-order kinetics

A first-order reaction has rate constant k = 0.1833 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.1833 = 3.78 s. Time for 10% remaining = -ln(0.1)/k = 12.56 s.

Problem 319: First-order kinetics

A first-order reaction has rate constant k = 0.19939 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.19939 = 3.48 s. Time for 20% remaining = -ln(0.2)/k = 8.07 s.

Problem 320: First-order kinetics

A first-order reaction has rate constant k = 0.12732 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12732 = 5.44 s. Time for 20% remaining = -ln(0.2)/k = 12.64 s.

Problem 321: First-order kinetics

A first-order reaction has rate constant k = 0.19384 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.19384 = 3.58 s. Time for 20% remaining = -ln(0.2)/k = 8.30 s.

Problem 322: First-order kinetics

A first-order reaction has rate constant k = 0.07024 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.07024 = 9.87 s. Time for 1% remaining = -ln(0.01)/k = 65.56 s.

Problem 323: First-order kinetics

A first-order reaction has rate constant k = 0.06489 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.06489 = 10.68 s. Time for 50% remaining = -ln(0.5)/k = 10.68 s.

Problem 324: First-order kinetics

A first-order reaction has rate constant k = 0.17169 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17169 = 4.04 s. Time for 1% remaining = -ln(0.01)/k = 26.82 s.

Problem 325: First-order kinetics

A first-order reaction has rate constant k = 0.08292 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08292 = 8.36 s. Time for 20% remaining = -ln(0.2)/k = 19.41 s.

Problem 326: First-order kinetics

A first-order reaction has rate constant k = 0.05836 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.05836 = 11.88 s. Time for 20% remaining = -ln(0.2)/k = 27.58 s.

Problem 327: First-order kinetics

A first-order reaction has rate constant k = 0.1629 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.1629 = 4.26 s. Time for 50% remaining = -ln(0.5)/k = 4.26 s.

Problem 328: First-order kinetics

A first-order reaction has rate constant k = 0.09151 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.09151 = 7.57 s. Time for 1% remaining = -ln(0.01)/k = 50.32 s.

Problem 329: First-order kinetics

A first-order reaction has rate constant k = 0.05123 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.05123 = 13.53 s. Time for 50% remaining = -ln(0.5)/k = 13.53 s.

Problem 330: First-order kinetics

A first-order reaction has rate constant k = 0.19407 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.19407 = 3.57 s. Time for 20% remaining = -ln(0.2)/k = 8.29 s.

Problem 331: First-order kinetics

A first-order reaction has rate constant k = 0.17312 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17312 = 4.00 s. Time for 50% remaining = -ln(0.5)/k = 4.00 s.

Problem 332: First-order kinetics

A first-order reaction has rate constant k = 0.13187 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.13187 = 5.26 s. Time for 20% remaining = -ln(0.2)/k = 12.20 s.

Problem 333: First-order kinetics

A first-order reaction has rate constant k = 0.08324 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08324 = 8.33 s. Time for 10% remaining = -ln(0.1)/k = 27.66 s.

Problem 334: First-order kinetics

A first-order reaction has rate constant k = 0.10417 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.10417 = 6.65 s. Time for 20% remaining = -ln(0.2)/k = 15.45 s.

Problem 335: First-order kinetics

A first-order reaction has rate constant k = 0.12546 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12546 = 5.52 s. Time for 50% remaining = -ln(0.5)/k = 5.52 s.

Problem 336: First-order kinetics

A first-order reaction has rate constant k = 0.04151 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.04151 = 16.70 s. Time for 10% remaining = -ln(0.1)/k = 55.47 s.

Problem 337: First-order kinetics

A first-order reaction has rate constant k = 0.18561 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.18561 = 3.73 s. Time for 20% remaining = -ln(0.2)/k = 8.67 s.

Problem 338: First-order kinetics

A first-order reaction has rate constant k = 0.17629 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17629 = 3.93 s. Time for 20% remaining = -ln(0.2)/k = 9.13 s.

Problem 339: First-order kinetics

A first-order reaction has rate constant k = 0.02516 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.02516 = 27.55 s. Time for 10% remaining = -ln(0.1)/k = 91.52 s.

Problem 340: First-order kinetics

A first-order reaction has rate constant k = 0.14225 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.14225 = 4.87 s. Time for 1% remaining = -ln(0.01)/k = 32.37 s.

Problem 341: First-order kinetics

A first-order reaction has rate constant k = 0.11062 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.11062 = 6.27 s. Time for 20% remaining = -ln(0.2)/k = 14.55 s.

Problem 342: First-order kinetics

A first-order reaction has rate constant k = 0.01955 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.01955 = 35.46 s. Time for 50% remaining = -ln(0.5)/k = 35.46 s.

Problem 343: First-order kinetics

A first-order reaction has rate constant k = 0.09283 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.09283 = 7.47 s. Time for 50% remaining = -ln(0.5)/k = 7.47 s.

Problem 344: First-order kinetics

A first-order reaction has rate constant k = 0.12989 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12989 = 5.34 s. Time for 10% remaining = -ln(0.1)/k = 17.73 s.

Problem 345: First-order kinetics

A first-order reaction has rate constant k = 0.10018 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

$t_{½}$ = ln2/k = 0.693147/0.10018 = 6.92 s. Time for 1% remaining = -ln(0.01)/k = 45.97 s.

Problem 346: First-order kinetics

A first-order reaction has rate constant k = 0.10227 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

$t_{½}$ = ln2/k = 0.693147/0.10227 = 6.78 s. Time for 1% remaining = -ln(0.01)/k = 45.03 s.

Problem 347: First-order kinetics

A first-order reaction has rate constant k = 0.08368 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

$t_{½}$ = ln2/k = 0.693147/0.08368 = 8.28 s. Time for 20% remaining = -ln(0.2)/k = 19.23 s.

Problem 348: First-order kinetics

A first-order reaction has rate constant k = 0.19607 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

$t_{½}$ = ln2/k = 0.693147/0.19607 = 3.54 s. Time for 10% remaining = -ln(0.1)/k = 11.74 s.

Problem 349: First-order kinetics

A first-order reaction has rate constant k = 0.0919 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

$t_{½}$ = ln2/k = 0.693147/0.0919 = 7.54 s. Time for 10% remaining = -ln(0.1)/k = 25.06 s.

Problem 350: First-order kinetics

A first-order reaction has rate constant k = 0.07733 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

$t_{½}$ = ln2/k = 0.693147/0.07733 = 8.96 s. Time for 10% remaining = -ln(0.1)/k = 29.78 s.

Problem 351: First-order kinetics

A first-order reaction has rate constant k = 0.17294 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17294 = 4.01 s. Time for 1% remaining = -ln(0.01)/k = 26.63 s.

Problem 352: First-order kinetics

A first-order reaction has rate constant k = 0.15476 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.15476 = 4.48 s. Time for 20% remaining = -ln(0.2)/k = 10.40 s.

Problem 353: First-order kinetics

A first-order reaction has rate constant k = 0.06864 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.06864 = 10.10 s. Time for 1% remaining = -ln(0.01)/k = 67.09 s.

Problem 354: First-order kinetics

A first-order reaction has rate constant k = 0.16429 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.16429 = 4.22 s. Time for 1% remaining = -ln(0.01)/k = 28.03 s.

Problem 355: First-order kinetics

A first-order reaction has rate constant k = 0.14548 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.14548 = 4.76 s. Time for 20% remaining = -ln(0.2)/k = 11.06 s.

Problem 356: First-order kinetics

A first-order reaction has rate constant k = 0.17319 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17319 = 4.00 s. Time for 20% remaining = -ln(0.2)/k = 9.29 s.

Problem 357: First-order kinetics

A first-order reaction has rate constant k = 0.10818 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.10818 = 6.41 s. Time for 1% remaining = -ln(0.01)/k = 42.57 s.

Problem 358: First-order kinetics

A first-order reaction has rate constant k = 0.06716 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.06716 = 10.32 s. Time for 20% remaining = -ln(0.2)/k = 23.96 s.

Problem 359: First-order kinetics

A first-order reaction has rate constant k = 0.09161 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.09161 = 7.57 s. Time for 1% remaining = -ln(0.01)/k = 50.27 s.

Problem 360: First-order kinetics

A first-order reaction has rate constant k = 0.17405 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17405 = 3.98 s. Time for 10% remaining = -ln(0.1)/k = 13.23 s.

Problem 361: First-order kinetics

A first-order reaction has rate constant k = 0.11479 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.11479 = 6.04 s. Time for 10% remaining = -ln(0.1)/k = 20.06 s.

Problem 362: First-order kinetics

A first-order reaction has rate constant k = 0.17135 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17135 = 4.05 s. Time for 20% remaining = -ln(0.2)/k = 9.39 s.

Problem 363: First-order kinetics

A first-order reaction has rate constant k = 0.00969 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.00969 = 71.53 s. Time for 20% remaining = -ln(0.2)/k = 166.09 s.

Problem 364: First-order kinetics

A first-order reaction has rate constant k = 0.14134 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.14134 = 4.90 s. Time for 20% remaining = -ln(0.2)/k = 11.39 s.

Problem 365: First-order kinetics

A first-order reaction has rate constant k = 0.07783 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.07783 = 8.91 s. Time for 10% remaining = -ln(0.1)/k = 29.58 s.

Problem 366: First-order kinetics

A first-order reaction has rate constant k = 0.09957 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.09957 = 6.96 s. Time for 50% remaining = -ln(0.5)/k = 6.96 s.

Problem 367: First-order kinetics

A first-order reaction has rate constant k = 0.02612 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.02612 = 26.54 s. Time for 1% remaining = -ln(0.01)/k = 176.31 s.

Problem 368: First-order kinetics

A first-order reaction has rate constant k = 0.17407 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17407 = 3.98 s. Time for 20% remaining = -ln(0.2)/k = 9.25 s.

Problem 369: First-order kinetics

A first-order reaction has rate constant k = 0.02084 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.02084 = 33.26 s. Time for 20% remaining = -ln(0.2)/k = 77.23 s.

Problem 370: First-order kinetics

A first-order reaction has rate constant k = 0.00405 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.00405 = 171.15 s. Time for 10% remaining = -ln(0.1)/k = 568.54 s.

Problem 371: First-order kinetics

A first-order reaction has rate constant $k = 0.08259\ s^{-1}$. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

$t½ = \ln2/k = 0.693147/0.08259 = 8.39$ s. Time for 10% remaining = $-\ln(0.1)/k = 27.88$ s.

Problem 372: First-order kinetics

A first-order reaction has rate constant $k = 0.01589\ s^{-1}$. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

$t½ = \ln2/k = 0.693147/0.01589 = 43.62$ s. Time for 1% remaining = $-\ln(0.01)/k = 289.82$ s.

Problem 373: First-order kinetics

A first-order reaction has rate constant $k = 0.06837\ s^{-1}$. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

$t½ = \ln2/k = 0.693147/0.06837 = 10.14$ s. Time for 20% remaining = $-\ln(0.2)/k = 23.54$ s.

Problem 374: First-order kinetics

A first-order reaction has rate constant $k = 0.13032\ s^{-1}$. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

$t½ = \ln2/k = 0.693147/0.13032 = 5.32$ s. Time for 1% remaining = $-\ln(0.01)/k = 35.34$ s.

Problem 375: First-order kinetics

A first-order reaction has rate constant $k = 0.17062\ s^{-1}$. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

$t½ = \ln2/k = 0.693147/0.17062 = 4.06$ s. Time for 20% remaining = $-\ln(0.2)/k = 9.43$ s.

Problem 376: First-order kinetics

A first-order reaction has rate constant $k = 0.19087\ s^{-1}$. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

$t½ = \ln2/k = 0.693147/0.19087 = 3.63$ s. Time for 20% remaining = $-\ln(0.2)/k = 8.43$ s.

Problem 377: First-order kinetics

A first-order reaction has rate constant $k = 0.1746\ s^{-1}$. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.1746 = 3.97 s. Time for 50% remaining = -ln(0.5)/k = 3.97 s.

Problem 378: First-order kinetics

A first-order reaction has rate constant k = 0.12387 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12387 = 5.60 s. Time for 10% remaining = -ln(0.1)/k = 18.59 s.

Problem 379: First-order kinetics

A first-order reaction has rate constant k = 0.1266 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.1266 = 5.48 s. Time for 1% remaining = -ln(0.01)/k = 36.38 s.

Problem 380: First-order kinetics

A first-order reaction has rate constant k = 0.19949 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.19949 = 3.47 s. Time for 50% remaining = -ln(0.5)/k = 3.47 s.

Problem 381: First-order kinetics

A first-order reaction has rate constant k = 0.08736 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08736 = 7.93 s. Time for 50% remaining = -ln(0.5)/k = 7.93 s.

Problem 382: First-order kinetics

A first-order reaction has rate constant k = 0.15231 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.15231 = 4.55 s. Time for 50% remaining = -ln(0.5)/k = 4.55 s.

Problem 383: First-order kinetics

A first-order reaction has rate constant k = 0.08929 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08929 = 7.76 s. Time for 1% remaining = -ln(0.01)/k = 51.58 s.

Problem 384: First-order kinetics

A first-order reaction has rate constant k = 0.18078 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.18078 = 3.83 s. Time for 50% remaining = -ln(0.5)/k = 3.83 s.

Problem 385: First-order kinetics

A first-order reaction has rate constant k = 0.06555 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.06555 = 10.57 s. Time for 50% remaining = -ln(0.5)/k = 10.57 s.

Problem 386: First-order kinetics

A first-order reaction has rate constant k = 0.05938 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.05938 = 11.67 s. Time for 1% remaining = -ln(0.01)/k = 77.55 s.

Problem 387: First-order kinetics

A first-order reaction has rate constant k = 0.08671 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.08671 = 7.99 s. Time for 10% remaining = -ln(0.1)/k = 26.56 s.

Problem 388: First-order kinetics

A first-order reaction has rate constant k = 0.1067 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.1067 = 6.50 s. Time for 10% remaining = -ln(0.1)/k = 21.58 s.

Problem 389: First-order kinetics

A first-order reaction has rate constant k = 0.03483 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.03483 = 19.90 s. Time for 50% remaining = -ln(0.5)/k = 19.90 s.

Problem 390: First-order kinetics

A first-order reaction has rate constant k = 0.12229 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12229 = 5.67 s. Time for 20% remaining = -ln(0.2)/k = 13.16 s.

Problem 391: First-order kinetics

A first-order reaction has rate constant k = 0.12432 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12432 = 5.58 s. Time for 10% remaining = -ln(0.1)/k = 18.52 s.

Problem 392: First-order kinetics

A first-order reaction has rate constant k = 0.10004 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.10004 = 6.93 s. Time for 10% remaining = -ln(0.1)/k = 23.02 s.

Problem 393: First-order kinetics

A first-order reaction has rate constant k = 0.04721 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.04721 = 14.68 s. Time for 1% remaining = -ln(0.01)/k = 97.55 s.

Problem 394: First-order kinetics

A first-order reaction has rate constant k = 0.09245 s^{-1}. Calculate half-life and time for concentration to fall to 50% of initial.

Solution:

t½ = ln2/k = 0.693147/0.09245 = 7.50 s. Time for 50% remaining = -ln(0.5)/k = 7.50 s.

Problem 395: First-order kinetics

A first-order reaction has rate constant k = 0.17988 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.17988 = 3.85 s. Time for 20% remaining = -ln(0.2)/k = 8.95 s.

Problem 396: First-order kinetics

A first-order reaction has rate constant k = 0.18034 s^{-1}. Calculate half-life and time for concentration to fall to 10% of initial.

Solution:

t½ = ln2/k = 0.693147/0.18034 = 3.84 s. Time for 10% remaining = -ln(0.1)/k = 12.77 s.

Problem 397: First-order kinetics

A first-order reaction has rate constant k = 0.0157 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.0157 = 44.15 s. Time for 1% remaining = -ln(0.01)/k = 293.32 s.

Problem 398: First-order kinetics

A first-order reaction has rate constant k = 0.19754 s^{-1}. Calculate half-life and time for concentration to fall to 1% of initial.

Solution:

t½ = ln2/k = 0.693147/0.19754 = 3.51 s. Time for 1% remaining = -ln(0.01)/k = 23.31 s.

Problem 399: First-order kinetics

A first-order reaction has rate constant k = 0.12815 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.12815 = 5.41 s. Time for 20% remaining = -ln(0.2)/k = 12.56 s.

Problem 400: First-order kinetics

A first-order reaction has rate constant k = 0.13837 s^{-1}. Calculate half-life and time for concentration to fall to 20% of initial.

Solution:

t½ = ln2/k = 0.693147/0.13837 = 5.01 s. Time for 20% remaining = -ln(0.2)/k = 11.63 s.

Problem 401: Arrhenius equation (Ea)

Rate constants: k1 = 8.453e-02 s^{-1} at 310 K and k2 = 2.699e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 49378.49 J/mol = 49.38 kJ/mol.

Problem 402: Arrhenius equation (Ea)

Rate constants: k1 = 1.067e-02 s^{-1} at 300 K and k2 = 5.061e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 42703.36 J/mol = 42.70 kJ/mol.

Problem 403: Arrhenius equation (Ea)

Rate constants: k1 = 2.959e-02 s^{-1} at 290 K and k2 = 2.203e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 51628.91 J/mol = 51.63 kJ/mol.

Problem 404: Arrhenius equation (Ea)

Rate constants: k1 = 3.959e-02 s^{-1} at 290 K and k2 = 6.210e-02 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 11582.27 J/mol = 11.58 kJ/mol.

Problem 405: Arrhenius equation (Ea)

Rate constants: k1 = 7.452e-02 s^{-1} at 300 K and k2 = 6.393e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 166196.07 J/mol = 166.20 kJ/mol.

Problem 406: Arrhenius equation (Ea)

Rate constants: k1 = 6.071e-02 s^{-1} at 298 K and k2 = 2.729e-01 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 40713.14 J/mol = 40.71 kJ/mol.

Problem 407: Arrhenius equation (Ea)

Rate constants: k1 = 2.507e-02 s^{-1} at 298 K and k2 = 1.986e-01 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 56067.27 J/mol = 56.07 kJ/mol.

Problem 408: Arrhenius equation (Ea)

Rate constants: k1 = 9.725e-03 s^{-1} at 290 K and k2 = 6.646e-02 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 71825.21 J/mol = 71.83 kJ/mol.

Problem 409: Arrhenius equation (Ea)

Rate constants: k1 = 7.886e-02 s^{-1} at 300 K and k2 = 1.407e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 15876.37 J/mol = 15.88 kJ/mol.

Problem 410: Arrhenius equation (Ea)

Rate constants: k1 = 1.315e-02 s^{-1} at 300 K and k2 = 1.214e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 60984.68 J/mol = 60.98 kJ/mol.

Problem 411: Arrhenius equation (Ea)

Rate constants: k1 = 4.156e-02 s^{-1} at 320 K and k2 = 1.333e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 52705.49 J/mol = 52.71 kJ/mol.

Problem 412: Arrhenius equation (Ea)

Rate constants: k1 = 5.309e-02 s^{-1} at 298 K and k2 = 4.919e-01 s^{-1} at 318 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 87702.65 J/mol = 87.70 kJ/mol.

Problem 413: Arrhenius equation (Ea)

Rate constants: k1 = 9.141e-02 s^{-1} at 300 K and k2 = 8.707e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 61844.16 J/mol = 61.84 kJ/mol.

Problem 414: Arrhenius equation (Ea)

Rate constants: k1 = 8.704e-02 s^{-1} at 310 K and k2 = 7.256e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 174904.37 J/mol = 174.90 kJ/mol.

Problem 415: Arrhenius equation (Ea)

Rate constants: k1 = 1.408e-02 s^{-1} at 310 K and k2 = 1.368e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 66418.05 J/mol = 66.42 kJ/mol.

Problem 416: Arrhenius equation (Ea)

Rate constants: k1 = 3.658e-02 s^{-1} at 290 K and k2 = 3.007e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 78733.54 J/mol = 78.73 kJ/mol.

Problem 417: Arrhenius equation (Ea)

Rate constants: k1 = 5.366e-02 s^{-1} at 300 K and k2 = 2.879e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 46096.02 J/mol = 46.10 kJ/mol.

Problem 418: Arrhenius equation (Ea)

Rate constants: k1 = 3.811e-02 s^{-1} at 300 K and k2 = 2.640e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 149663.38 J/mol = 149.66 kJ/mol.

Problem 419: Arrhenius equation (Ea)

Rate constants: k1 = 6.749e-02 s^{-1} at 320 K and k2 = 3.717e-01 s^{-1} at 350 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 52959.11 J/mol = 52.96 kJ/mol.

Problem 420: Arrhenius equation (Ea)

Rate constants: k1 = 3.281e-02 s^{-1} at 290 K and k2 = 2.193e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 48866.12 J/mol = 48.87 kJ/mol.

Problem 421: Arrhenius equation (Ea)

Rate constants: k1 = 8.239e-02 s^{-1} at 300 K and k2 = 7.604e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 60978.61 J/mol = 60.98 kJ/mol.

Problem 422: Arrhenius equation (Ea)

Rate constants: k1 = 4.084e-02 s^{-1} at 290 K and k2 = 1.098e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 36956.28 J/mol = 36.96 kJ/mol.

Problem 423: Arrhenius equation (Ea)

Rate constants: k1 = 9.959e-02 s^{-1} at 298 K and k2 = 2.477e-01 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 24681.00 J/mol = 24.68 kJ/mol.

Problem 424: Arrhenius equation (Ea)

Rate constants: k1 = 1.358e-02 s^{-1} at 320 K and k2 = 7.271e-02 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 75906.67 J/mol = 75.91 kJ/mol.

Problem 425: Arrhenius equation (Ea)

Rate constants: k1 = 5.874e-02 s^{-1} at 310 K and k2 = 4.509e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 59536.23 J/mol = 59.54 kJ/mol.

Problem 426: Arrhenius equation (Ea)

Rate constants: k1 = 9.911e-03 s^{-1} at 310 K and k2 = 5.609e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 73715.74 J/mol = 73.72 kJ/mol.

Problem 427: Arrhenius equation (Ea)

Rate constants: k1 = 3.281e-03 s^{-1} at 310 K and k2 = 1.526e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 65356.09 J/mol = 65.36 kJ/mol.

Problem 428: Arrhenius equation (Ea)

Rate constants: k1 = 9.506e-02 s^{-1} at 290 K and k2 = 8.338e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 55849.38 J/mol = 55.85 kJ/mol.

Problem 429: Arrhenius equation (Ea)

Rate constants: k1 = 3.674e-02 s^{-1} at 300 K and k2 = 3.367e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 171299.16 J/mol = 171.30 kJ/mol.

Problem 430: Arrhenius equation (Ea)

Rate constants: k1 = 3.982e-02 s^{-1} at 290 K and k2 = 1.240e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 42445.34 J/mol = 42.45 kJ/mol.

Problem 431: Arrhenius equation (Ea)

Rate constants: k1 = 9.176e-03 s^{-1} at 320 K and k2 = 3.031e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 104904.37 J/mol = 104.90 kJ/mol.

Problem 432: Arrhenius equation (Ea)

Rate constants: k1 = 5.067e-03 s^{-1} at 298 K and k2 = 2.197e-02 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 39731.87 J/mol = 39.73 kJ/mol.

Problem 433: Arrhenius equation (Ea)

Rate constants: k1 = 2.053e-02 s^{-1} at 320 K and k2 = 1.756e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 188449.76 J/mol = 188.45 kJ/mol.

Problem 434: Arrhenius equation (Ea)

Rate constants: k1 = 5.864e-02 s^{-1} at 298 K and k2 = 4.932e-01 s^{-1} at 318 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 83894.26 J/mol = 83.89 kJ/mol.

Problem 435: Arrhenius equation (Ea)

Rate constants: k1 = 7.744e-02 s^{-1} at 320 K and k2 = 6.353e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 184781.67 J/mol = 184.78 kJ/mol.

Problem 436: Arrhenius equation (Ea)

Rate constants: k1 = 2.773e-02 s^{-1} at 298 K and k2 = 2.736e-01 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 62005.88 J/mol = 62.01 kJ/mol.

Problem 437: Arrhenius equation (Ea)

Rate constants: k1 = 2.507e-02 s^{-1} at 290 K and k2 = 7.480e-02 s^{-1} at 300 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 79063.43 J/mol = 79.06 kJ/mol.

Problem 438: Arrhenius equation (Ea)

Rate constants: k1 = 1.496e-03 s^{-1} at 298 K and k2 = 1.229e-02 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 57049.29 J/mol = 57.05 kJ/mol.

Problem 439: Arrhenius equation (Ea)

Rate constants: k1 = 3.238e-02 s^{-1} at 290 K and k2 = 9.654e-02 s^{-1} at 300 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 79011.69 J/mol = 79.01 kJ/mol.

Problem 440: Arrhenius equation (Ea)

Rate constants: k1 = 7.417e-02 s^{-1} at 290 K and k2 = 4.429e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 66787.81 J/mol = 66.79 kJ/mol.

Problem 441: Arrhenius equation (Ea)

Rate constants: k1 = 4.483e-02 s^{-1} at 320 K and k2 = 2.052e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 133555.10 J/mol = 133.56 kJ/mol.

Problem 442: Arrhenius equation (Ea)

Rate constants: k1 = 4.521e-02 s^{-1} at 320 K and k2 = 1.529e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 107012.75 J/mol = 107.01 kJ/mol.

Problem 443: Arrhenius equation (Ea)

Rate constants: k1 = 7.273e-02 s^{-1} at 320 K and k2 = 6.709e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 100495.82 J/mol = 100.50 kJ/mol.

Problem 444: Arrhenius equation (Ea)

Rate constants: k1 = 4.581e-02 s^{-1} at 290 K and k2 = 4.441e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 84895.05 J/mol = 84.90 kJ/mol.

Problem 445: Arrhenius equation (Ea)

Rate constants: k1 = 8.473e-02 s^{-1} at 290 K and k2 = 4.341e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 61060.98 J/mol = 61.06 kJ/mol.

Problem 446: Arrhenius equation (Ea)

Rate constants: k1 = 7.124e-02 s^{-1} at 290 K and k2 = 3.755e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 62117.89 J/mol = 62.12 kJ/mol.

Problem 447: Arrhenius equation (Ea)

Rate constants: k1 = 6.083e-02 s^{-1} at 300 K and k2 = 1.252e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 19806.74 J/mol = 19.81 kJ/mol.

Problem 448: Arrhenius equation (Ea)

Rate constants: k1 = 6.331e-02 s^{-1} at 300 K and k2 = 3.901e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 72565.06 J/mol = 72.57 kJ/mol.

Problem 449: Arrhenius equation (Ea)

Rate constants: k1 = 9.946e-02 s^{-1} at 310 K and k2 = 5.977e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 52387.29 J/mol = 52.39 kJ/mol.

Problem 450: Arrhenius equation (Ea)

Rate constants: k1 = 6.055e-02 s^{-1} at 290 K and k2 = 1.419e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 21898.51 J/mol = 21.90 kJ/mol.

Problem 451: Arrhenius equation (Ea)

Rate constants: k1 = 6.510e-02 s^{-1} at 298 K and k2 = 5.231e-01 s^{-1} at 318 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 82098.60 J/mol = 82.10 kJ/mol.

Problem 452: Arrhenius equation (Ea)

Rate constants: k1 = 4.516e-02 s^{-1} at 300 K and k2 = 1.555e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 49332.41 J/mol = 49.33 kJ/mol.

Problem 453: Arrhenius equation (Ea)

Rate constants: k1 = 3.988e-02 s^{-1} at 300 K and k2 = 3.071e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 81472.76 J/mol = 81.47 kJ/mol.

Problem 454: Arrhenius equation (Ea)

Rate constants: k1 = 3.126e-02 s^{-1} at 298 K and k2 = 1.146e-01 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 35196.33 J/mol = 35.20 kJ/mol.

Problem 455: Arrhenius equation (Ea)

Rate constants: k1 = 9.230e-02 s^{-1} at 290 K and k2 = 1.911e-01 s^{-1} at 300 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 52649.95 J/mol = 52.65 kJ/mol.

Problem 456: Arrhenius equation (Ea)

Rate constants: k1 = 4.319e-02 s^{-1} at 300 K and k2 = 3.382e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 159121.11 J/mol = 159.12 kJ/mol.

Problem 457: Arrhenius equation (Ea)

Rate constants: k1 = 5.564e-02 s^{-1} at 320 K and k2 = 3.608e-01 s^{-1} at 350 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 58030.04 J/mol = 58.03 kJ/mol.

Problem 458: Arrhenius equation (Ea)

Rate constants: k1 = 3.297e-02 s^{-1} at 300 K and k2 = 8.371e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 25565.29 J/mol = 25.57 kJ/mol.

Problem 459: Arrhenius equation (Ea)

Rate constants: k1 = 9.411e-02 s^{-1} at 290 K and k2 = 4.795e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 60853.51 J/mol = 60.85 kJ/mol.

Problem 460: Arrhenius equation (Ea)

Rate constants: k1 = 6.005e-02 s^{-1} at 320 K and k2 = 2.695e-01 s^{-1} at 350 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 46611.53 J/mol = 46.61 kJ/mol.

Problem 461: Arrhenius equation (Ea)

Rate constants: k1 = 2.128e-02 s^{-1} at 298 K and k2 = 1.507e-01 s^{-1} at 308 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 149390.69 J/mol = 149.39 kJ/mol.

Problem 462: Arrhenius equation (Ea)

Rate constants: k1 = 3.502e-02 s^{-1} at 290 K and k2 = 2.181e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 68359.75 J/mol = 68.36 kJ/mol.

Problem 463: Arrhenius equation (Ea)

Rate constants: k1 = 5.741e-02 s^{-1} at 320 K and k2 = 4.801e-01 s^{-1} at 350 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 65918.68 J/mol = 65.92 kJ/mol.

Problem 464: Arrhenius equation (Ea)

Rate constants: k1 = 6.136e-02 s^{-1} at 290 K and k2 = 4.273e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 49911.13 J/mol = 49.91 kJ/mol.

Problem 465: Arrhenius equation (Ea)

Rate constants: k1 = 9.291e-02 s^{-1} at 300 K and k2 = 7.944e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 165936.84 J/mol = 165.94 kJ/mol.

Problem 466: Arrhenius equation (Ea)

Rate constants: k1 = 1.805e-02 s^{-1} at 300 K and k2 = 1.349e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 80269.36 J/mol = 80.27 kJ/mol.

Problem 467: Arrhenius equation (Ea)

Rate constants: k1 = 3.511e-02 s^{-1} at 298 K and k2 = 1.068e-01 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 30137.15 J/mol = 30.14 kJ/mol.

Problem 468: Arrhenius equation (Ea)

Rate constants: k1 = 6.574e-02 s^{-1} at 290 K and k2 = 1.375e-01 s^{-1} at 300 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 53374.44 J/mol = 53.37 kJ/mol.

Problem 469: Arrhenius equation (Ea)

Rate constants: k1 = 7.461e-02 s^{-1} at 310 K and k2 = 2.484e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 51143.07 J/mol = 51.14 kJ/mol.

Problem 470: Arrhenius equation (Ea)

Rate constants: k1 = 3.410e-02 s^{-1} at 300 K and k2 = 1.584e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 42141.29 J/mol = 42.14 kJ/mol.

Problem 471: Arrhenius equation (Ea)

Rate constants: k1 = 5.963e-02 s^{-1} at 298 K and k2 = 5.371e-01 s^{-1} at 308 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 167749.08 J/mol = 167.75 kJ/mol.

Problem 472: Arrhenius equation (Ea)

Rate constants: k1 = 7.545e-02 s^{-1} at 290 K and k2 = 1.451e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 24437.67 J/mol = 24.44 kJ/mol.

Problem 473: Arrhenius equation (Ea)

Rate constants: k1 = 4.432e-02 s^{-1} at 320 K and k2 = 2.262e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 73728.23 J/mol = 73.73 kJ/mol.

Problem 474: Arrhenius equation (Ea)

Rate constants: k1 = 4.142e-02 s^{-1} at 320 K and k2 = 1.380e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 105683.42 J/mol = 105.68 kJ/mol.

Problem 475: Arrhenius equation (Ea)

Rate constants: k1 = 3.452e-02 s^{-1} at 320 K and k2 = 8.433e-02 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 40393.16 J/mol = 40.39 kJ/mol.

Problem 476: Arrhenius equation (Ea)

Rate constants: k1 = 5.270e-02 s^{-1} at 298 K and k2 = 2.172e-01 s^{-1} at 318 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 55793.33 J/mol = 55.79 kJ/mol.

Problem 477: Arrhenius equation (Ea)

Rate constants: k1 = 9.844e-02 s^{-1} at 298 K and k2 = 1.935e-01 s^{-1} at 318 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 26624.38 J/mol = 26.62 kJ/mol.

Problem 478: Arrhenius equation (Ea)

Rate constants: k1 = 9.453e-02 s^{-1} at 300 K and k2 = 7.584e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 83101.25 J/mol = 83.10 kJ/mol.

Problem 479: Arrhenius equation (Ea)

Rate constants: k1 = 3.282e-02 s^{-1} at 310 K and k2 = 5.138e-02 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 36978.49 J/mol = 36.98 kJ/mol.

Problem 480: Arrhenius equation (Ea)

Rate constants: k1 = 1.293e-02 s^{-1} at 298 K and k2 = 7.791e-02 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 48659.50 J/mol = 48.66 kJ/mol.

Problem 481: Arrhenius equation (Ea)

Rate constants: k1 = 5.588e-02 s^{-1} at 300 K and k2 = 4.011e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 152412.61 J/mol = 152.41 kJ/mol.

Problem 482: Arrhenius equation (Ea)

Rate constants: k1 = 3.971e-02 s^{-1} at 310 K and k2 = 3.101e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 169500.73 J/mol = 169.50 kJ/mol.

Problem 483: Arrhenius equation (Ea)

Rate constants: k1 = 4.598e-02 s^{-1} at 300 K and k2 = 9.940e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 21153.28 J/mol = 21.15 kJ/mol.

Problem 484: Arrhenius equation (Ea)

Rate constants: k1 = 4.293e-02 s^{-1} at 310 K and k2 = 2.120e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 67912.80 J/mol = 67.91 kJ/mol.

Problem 485: Arrhenius equation (Ea)

Rate constants: k1 = 1.153e-02 s^{-1} at 300 K and k2 = 1.933e-02 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 39990.21 J/mol = 39.99 kJ/mol.

Problem 486: Arrhenius equation (Ea)

Rate constants: k1 = 8.013e-02 s^{-1} at 300 K and k2 = 5.412e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 147700.97 J/mol = 147.70 kJ/mol.

Problem 487: Arrhenius equation (Ea)

Rate constants: k1 = 4.368e-02 s^{-1} at 310 K and k2 = 1.048e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 25571.75 J/mol = 25.57 kJ/mol.

Problem 488: Arrhenius equation (Ea)

Rate constants: k1 = 4.005e-02 s^{-1} at 300 K and k2 = 8.685e-02 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 21237.78 J/mol = 21.24 kJ/mol.

Problem 489: Arrhenius equation (Ea)

Rate constants: k1 = 3.396e-02 s^{-1} at 298 K and k2 = 1.471e-01 s^{-1} at 308 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 111861.63 J/mol = 111.86 kJ/mol.

Problem 490: Arrhenius equation (Ea)

Rate constants: k1 = 5.105e-02 s^{-1} at 320 K and k2 = 1.261e-01 s^{-1} at 330 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 79363.51 J/mol = 79.36 kJ/mol.

Problem 491: Arrhenius equation (Ea)

Rate constants: k1 = 9.059e-02 s^{-1} at 298 K and k2 = 4.049e-01 s^{-1} at 308 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 114265.60 J/mol = 114.27 kJ/mol.

Problem 492: Arrhenius equation (Ea)

Rate constants: k1 = 1.029e-02 s^{-1} at 298 K and k2 = 3.782e-02 s^{-1} at 328 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 35263.97 J/mol = 35.26 kJ/mol.

Problem 493: Arrhenius equation (Ea)

Rate constants: k1 = 1.530e-02 s^{-1} at 290 K and k2 = 1.216e-01 s^{-1} at 300 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 149990.03 J/mol = 149.99 kJ/mol.

Problem 494: Arrhenius equation (Ea)

Rate constants: k1 = 9.513e-02 s^{-1} at 310 K and k2 = 6.505e-01 s^{-1} at 340 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 56157.07 J/mol = 56.16 kJ/mol.

Problem 495: Arrhenius equation (Ea)

Rate constants: k1 = 7.599e-02 s^{-1} at 320 K and k2 = 4.039e-01 s^{-1} at 350 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 51858.50 J/mol = 51.86 kJ/mol.

Problem 496: Arrhenius equation (Ea)

Rate constants: k1 = 6.353e-02 s^{-1} at 300 K and k2 = 4.326e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 148320.95 J/mol = 148.32 kJ/mol.

Problem 497: Arrhenius equation (Ea)

Rate constants: k1 = 4.398e-02 s^{-1} at 300 K and k2 = 2.413e-01 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 67932.55 J/mol = 67.93 kJ/mol.

Problem 498: Arrhenius equation (Ea)

Rate constants: k1 = 5.915e-02 s^{-1} at 290 K and k2 = 2.657e-01 s^{-1} at 310 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 56142.06 J/mol = 56.14 kJ/mol.

Problem 499: Arrhenius equation (Ea)

Rate constants: k1 = 4.618e-02 s^{-1} at 300 K and k2 = 8.403e-02 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 23891.80 J/mol = 23.89 kJ/mol.

Problem 500: Arrhenius equation (Ea)

Rate constants: k1 = 7.682e-03 s^{-1} at 290 K and k2 = 6.796e-02 s^{-1} at 320 K. Calculate activation energy Ea (kJ/mol).

Solution:

Using ln(k2/k1) = -Ea/R (1/T2 - 1/T1). Ea = 56067.78 J/mol = 56.07 kJ/mol.

Problem 501: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.823 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.823 = 0.933 K. New boiling point ≈ 100.933 °C.

Problem 502: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.442 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.442 = 0.738 K. New boiling point ≈ 100.738 °C.

Problem 503: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.867 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.867 = 1.468 K. New boiling point ≈ 101.468 °C.

Problem 504: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.698 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.698 = 1.381 K. New boiling point ≈ 101.381 °C.

Problem 505: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.736 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.736 = 1.401 K. New boiling point ≈ 101.401 °C.

Problem 506: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.99 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.99 = 1.019 K. New boiling point ≈ 101.019 °C.

Problem 507: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.855 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 1.855 = 0.950$ K. New boiling point ≈ 100.950 °C.

Problem 508: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.537 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 0.537 = 0.275$ K. New boiling point ≈ 100.275 °C.

Problem 509: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.407 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 1.407 = 0.720$ K. New boiling point ≈ 100.720 °C.

Problem 510: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.949 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 2.949 = 1.510$ K. New boiling point ≈ 101.510 °C.

Problem 511: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.563 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 1.563 = 0.800$ K. New boiling point ≈ 100.800 °C.

Problem 512: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.214 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 0.214 = 0.110$ K. New boiling point ≈ 100.110 °C.

Problem 513: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.369 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 1.369 = 0.701$ K. New boiling point ≈ 100.701 °C.

Problem 514: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.62 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

$\Delta T_b = K_b \cdot m = 0.512 \times 1.62 = 0.829$ K. New boiling point ≈ 100.829 °C.

Problem 515: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.56 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

$\Delta T_b = K_b \cdot m = 0.512 \times 0.56 = 0.287$ K. New boiling point ≈ 100.287 °C.

Problem 516: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.762 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

$\Delta T_b = K_b \cdot m = 0.512 \times 2.762 = 1.414$ K. New boiling point ≈ 101.414 °C.

Problem 517: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.285 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

$\Delta T_b = K_b \cdot m = 0.512 \times 1.285 = 0.658$ K. New boiling point ≈ 100.658 °C.

Problem 518: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.069 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

$\Delta T_b = K_b \cdot m = 0.512 \times 2.069 = 1.059$ K. New boiling point ≈ 101.059 °C.

Problem 519: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.389 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

$\Delta T_b = K_b \cdot m = 0.512 \times 2.389 = 1.223$ K. New boiling point ≈ 101.223 °C.

Problem 520: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.07 m in water ($K_b = 0.512$ K kg mol^{-1}). Calculate boiling point elevation ΔT_b and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.07 = 0.548 K. New boiling point ≈ 100.548 °C.

Problem 521: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.374 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.374 = 0.191 K. New boiling point ≈ 100.191 °C.

Problem 522: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.221 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.221 = 0.625 K. New boiling point ≈ 100.625 °C.

Problem 523: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.199 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.199 = 1.126 K. New boiling point ≈ 101.126 °C.

Problem 524: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.897 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.897 = 1.483 K. New boiling point ≈ 101.483 °C.

Problem 525: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.633 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.633 = 1.348 K. New boiling point ≈ 101.348 °C.

Problem 526: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.336 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.336 = 0.172 K. New boiling point ≈ 100.172 °C.

Problem 527: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.51 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.51 = 0.261 K. New boiling point ≈ 100.261 °C.

Problem 528: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.0 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.0 = 0.512 K. New boiling point ≈ 100.512 °C.

Problem 529: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.126 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.126 = 1.089 K. New boiling point ≈ 101.089 °C.

Problem 530: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.474 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.474 = 0.243 K. New boiling point ≈ 100.243 °C.

Problem 531: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.82 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.82 = 1.444 K. New boiling point ≈ 101.444 °C.

Problem 532: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.721 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.721 = 0.881 K. New boiling point ≈ 100.881 °C.

Problem 533: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.396 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 2.396 = 1.227$ K. New boiling point ≈ 101.227 °C.

Problem 534: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.043 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 2.043 = 1.046$ K. New boiling point ≈ 101.046 °C.

Problem 535: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.992 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 2.992 = 1.532$ K. New boiling point ≈ 101.532 °C.

Problem 536: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.371 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 0.371 = 0.190$ K. New boiling point ≈ 100.190 °C.

Problem 537: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.328 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 1.328 = 0.680$ K. New boiling point ≈ 100.680 °C.

Problem 538: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.153 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 0.153 = 0.078$ K. New boiling point ≈ 100.078 °C.

Problem 539: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.623 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb \cdot m = 0.512 \times 0.623 = 0.319$ K. New boiling point ≈ 100.319 °C.

Problem 540: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.091 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.091 = 0.559 K. New boiling point ≈ 100.559 °C.

Problem 541: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.657 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.657 = 0.336 K. New boiling point ≈ 100.336 °C.

Problem 542: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.549 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.549 = 0.281 K. New boiling point ≈ 100.281 °C.

Problem 543: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.549 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.549 = 1.305 K. New boiling point ≈ 101.305 °C.

Problem 544: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.572 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.572 = 0.805 K. New boiling point ≈ 100.805 °C.

Problem 545: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.522 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.522 = 1.291 K. New boiling point ≈ 101.291 °C.

Problem 546: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.209 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.209 = 0.107 K. New boiling point ≈ 100.107 °C.

Problem 547: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.642 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.642 = 1.353 K. New boiling point ≈ 101.353 °C.

Problem 548: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.48 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.48 = 0.246 K. New boiling point ≈ 100.246 °C.

Problem 549: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.547 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.547 = 0.280 K. New boiling point ≈ 100.280 °C.

Problem 550: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.511 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.511 = 1.286 K. New boiling point ≈ 101.286 °C.

Problem 551: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.446 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.446 = 1.252 K. New boiling point ≈ 101.252 °C.

Problem 552: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.191 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.191 = 1.122 K. New boiling point ≈ 101.122 °C.

Problem 553: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.291 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.291 = 0.661 K. New boiling point ≈ 100.661 °C.

Problem 554: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.187 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.187 = 1.120 K. New boiling point ≈ 101.120 °C.

Problem 555: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.871 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.871 = 0.958 K. New boiling point ≈ 100.958 °C.

Problem 556: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.373 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.373 = 1.215 K. New boiling point ≈ 101.215 °C.

Problem 557: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.649 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.649 = 0.844 K. New boiling point ≈ 100.844 °C.

Problem 558: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.9 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.9 = 1.485 K. New boiling point ≈ 101.485 °C.

Problem 559: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.722 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 2.722 = 1.394$ K. New boiling point ≈ 101.394 °C.

Problem 560: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.167 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 1.167 = 0.598$ K. New boiling point ≈ 100.598 °C.

Problem 561: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.955 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 2.955 = 1.513$ K. New boiling point ≈ 101.513 °C.

Problem 562: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.331 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 2.331 = 1.193$ K. New boiling point ≈ 101.193 °C.

Problem 563: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.558 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 1.558 = 0.798$ K. New boiling point ≈ 100.798 °C.

Problem 564: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.902 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 2.902 = 1.486$ K. New boiling point ≈ 101.486 °C.

Problem 565: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.424 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

$\Delta Tb = Kb\cdot m = 0.512\times 2.424 = 1.241$ K. New boiling point ≈ 101.241 °C.

Problem 566: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.632 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.632 = 1.348 K. New boiling point ≈ 101.348 °C.

Problem 567: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.959 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.959 = 1.003 K. New boiling point ≈ 101.003 °C.

Problem 568: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.708 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.708 = 0.874 K. New boiling point ≈ 100.874 °C.

Problem 569: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.163 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.163 = 1.107 K. New boiling point ≈ 101.107 °C.

Problem 570: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.568 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.568 = 1.315 K. New boiling point ≈ 101.315 °C.

Problem 571: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.343 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.343 = 0.176 K. New boiling point ≈ 100.176 °C.

Problem 572: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.891 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.891 = 0.456 K. New boiling point ≈ 100.456 °C.

Problem 573: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.527 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.527 = 0.270 K. New boiling point ≈ 100.270 °C.

Problem 574: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.366 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.366 = 0.187 K. New boiling point ≈ 100.187 °C.

Problem 575: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.468 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.468 = 1.264 K. New boiling point ≈ 101.264 °C.

Problem 576: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.798 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.798 = 1.433 K. New boiling point ≈ 101.433 °C.

Problem 577: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.254 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.254 = 0.130 K. New boiling point ≈ 100.130 °C.

Problem 578: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.184 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.184 = 0.606 K. New boiling point ≈ 100.606 °C.

Problem 579: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.984 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.984 = 1.528 K. New boiling point ≈ 101.528 °C.

Problem 580: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.751 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.751 = 0.385 K. New boiling point ≈ 100.385 °C.

Problem 581: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.799 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.799 = 1.433 K. New boiling point ≈ 101.433 °C.

Problem 582: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.985 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.985 = 1.016 K. New boiling point ≈ 101.016 °C.

Problem 583: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.499 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.499 = 0.255 K. New boiling point ≈ 100.255 °C.

Problem 584: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.76 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.76 = 1.413 K. New boiling point ≈ 101.413 °C.

Problem 585: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.119 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.119 = 1.085 K. New boiling point ≈ 101.085 °C.

Problem 586: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.301 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.301 = 1.178 K. New boiling point ≈ 101.178 °C.

Problem 587: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.401 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.401 = 0.717 K. New boiling point ≈ 100.717 °C.

Problem 588: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.727 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.727 = 1.396 K. New boiling point ≈ 101.396 °C.

Problem 589: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.842 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.842 = 0.431 K. New boiling point ≈ 100.431 °C.

Problem 590: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.692 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.692 = 0.866 K. New boiling point ≈ 100.866 °C.

Problem 591: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.866 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.866 = 0.955 K. New boiling point ≈ 100.955 °C.

Problem 592: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.422 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.422 = 0.216 K. New boiling point ≈ 100.216 °C.

Problem 593: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.789 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.789 = 0.404 K. New boiling point ≈ 100.404 °C.

Problem 594: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.238 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.238 = 0.122 K. New boiling point ≈ 100.122 °C.

Problem 595: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.953 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.953 = 1.000 K. New boiling point ≈ 101.000 °C.

Problem 596: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.426 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.426 = 0.730 K. New boiling point ≈ 100.730 °C.

Problem 597: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 2.526 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×2.526 = 1.293 K. New boiling point ≈ 101.293 °C.

Problem 598: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.831 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.831 = 0.937 K. New boiling point ≈ 100.937 °C.

Problem 599: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 1.933 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×1.933 = 0.990 K. New boiling point ≈ 100.990 °C.

Problem 600: Colligative properties - boiling point elevation

A non-volatile solute gives solution of molality 0.802 m in water (Kb = 0.512 K kg mol^{-1}). Calculate boiling point elevation ΔTb and new boiling point.

Solution:

ΔTb = Kb·m = 0.512×0.802 = 0.411 K. New boiling point ≈ 100.411 °C.

Problem 601: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.973 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.973 = -281640.68 J/mol = -281.64 kJ/mol.

Problem 602: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.633 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.633 = -183225.65 J/mol = -183.23 kJ/mol.

Problem 603: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.537 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.537 = -207250.49 J/mol = -207.25 kJ/mol.

Problem 604: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.142 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.142 = -110186.25 J/mol = -110.19 kJ/mol.

Problem 605: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.322 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.322 = -93204.83 J/mol = -93.20 kJ/mol.

Problem 606: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.903 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×0.903 = -87126.25 J/mol = -87.13 kJ/mol.

Problem 607: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.278 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.278 = -107291.69 J/mol = -107.29 kJ/mol.

Problem 608: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.966 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.966 = -758760.65 J/mol = -758.76 kJ/mol.

Problem 609: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.545 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.545 = -447209.51 J/mol = -447.21 kJ/mol.

Problem 610: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.619 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.619 = -468629.26 J/mol = -468.63 kJ/mol.

Problem 611: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.634 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.634 = -183515.10 J/mol = -183.52 kJ/mol.

Problem 612: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.589 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.589 = -153315.19 J/mol = -153.32 kJ/mol.

Problem 613: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.44 V and n = 3. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -3×96485×0.440 = -127360.64$ J/mol = -127.36 kJ/mol.

Problem 614: Electrochemistry - ΔG and E

A cell has standard potential $E° = 1.183$ V and $n = 3$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -3×96485×1.183 = -342426.44$ J/mol = -342.43 kJ/mol.

Problem 615: Electrochemistry - ΔG and E

A cell has standard potential $E° = 1.695$ V and $n = 2$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -2×96485×1.695 = -327085.28$ J/mol = -327.09 kJ/mol.

Problem 616: Electrochemistry - ΔG and E

A cell has standard potential $E° = 1.965$ V and $n = 4$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -4×96485×1.965 = -758374.71$ J/mol = -758.37 kJ/mol.

Problem 617: Electrochemistry - ΔG and E

A cell has standard potential $E° = 1.337$ V and $n = 4$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -4×96485×1.337 = -516003.56$ J/mol = -516.00 kJ/mol.

Problem 618: Electrochemistry - ΔG and E

A cell has standard potential $E° = 0.314$ V and $n = 2$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -2×96485×0.314 = -60592.79$ J/mol = -60.59 kJ/mol.

Problem 619: Electrochemistry - ΔG and E

A cell has standard potential $E° = 0.267$ V and $n = 4$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -4×96485×0.267 = -103046.33$ J/mol = -103.05 kJ/mol.

Problem 620: Electrochemistry - ΔG and E

A cell has standard potential $E° = 0.279$ V and $n = 2$. Calculate $\Delta G°$ at 298 K.

Solution:

$\Delta G° = -nFE° = -2×96485×0.279 = -53838.82$ J/mol = -53.84 kJ/mol.

Problem 621: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.794 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.794 = -346189.37 J/mol = -346.19 kJ/mol.

Problem 622: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.88 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.880 = -544177.27 J/mol = -544.18 kJ/mol.

Problem 623: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.98 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.980 = -764163.83 J/mol = -764.16 kJ/mol.

Problem 624: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.656 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.656 = -253177.51 J/mol = -253.18 kJ/mol.

Problem 625: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.715 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×0.715 = -137974.02 J/mol = -137.97 kJ/mol.

Problem 626: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.758 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.758 = -169621.21 J/mol = -169.62 kJ/mol.

Problem 627: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.692 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.692 = -200303.55 J/mol = -200.30 kJ/mol.

Problem 628: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.987 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.987 = -285693.07 J/mol = -285.69 kJ/mol.

Problem 629: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.538 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.538 = -593577.76 J/mol = -593.58 kJ/mol.

Problem 630: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.81 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.810 = -312612.48 J/mol = -312.61 kJ/mol.

Problem 631: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.093 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.093 = -210916.94 J/mol = -210.92 kJ/mol.

Problem 632: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.861 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.861 = -332295.48 J/mol = -332.30 kJ/mol.

Problem 633: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.642 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.642 = -475286.75 J/mol = -475.29 kJ/mol.

Problem 634: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.342 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.342 = -131991.93 J/mol = -131.99 kJ/mol.

Problem 635: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.182 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.182 = -228091.33 J/mol = -228.09 kJ/mol.

Problem 636: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.385 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.385 = -111440.56 J/mol = -111.44 kJ/mol.

Problem 637: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.39 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.390 = -402343.83 J/mol = -402.34 kJ/mol.

Problem 638: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.003 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.003 = -290324.36 J/mol = -290.32 kJ/mol.

Problem 639: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.5 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.500 = -192970.66 J/mol = -192.97 kJ/mol.

Problem 640: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.833 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.833 = -321489.13 J/mol = -321.49 kJ/mol.

Problem 641: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.508 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.508 = -145499.88 J/mol = -145.50 kJ/mol.

Problem 642: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.307 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.307 = -378318.99 J/mol = -378.32 kJ/mol.

Problem 643: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.694 V and n = 4. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -4\times96485\times0.694 = -267843.28$ J/mol = -267.84 kJ/mol.

Problem 644: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.335$ V and $n = 1$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -1\times96485\times0.335 = -32322.59$ J/mol = -32.32 kJ/mol.

Problem 645: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.854$ V and $n = 4$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -4\times96485\times0.854 = -329593.89$ J/mol = -329.59 kJ/mol.

Problem 646: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.915$ V and $n = 2$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -2\times96485\times1.915 = -369538.82$ J/mol = -369.54 kJ/mol.

Problem 647: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.728$ V and $n = 2$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -2\times96485\times1.728 = -333453.31$ J/mol = -333.45 kJ/mol.

Problem 648: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.263$ V and $n = 4$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -4\times96485\times0.263 = -101502.57$ J/mol = -101.50 kJ/mol.

Problem 649: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.625$ V and $n = 1$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -1\times96485\times0.625 = -60303.33$ J/mol = -60.30 kJ/mol.

Problem 650: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.852$ V and $n = 3$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -3\times96485\times0.852 = -246616.51$ J/mol = -246.62 kJ/mol.

Problem 651: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.289 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.289 = -124369.59 J/mol = -124.37 kJ/mol.

Problem 652: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.908 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.908 = -736376.05 J/mol = -736.38 kJ/mol.

Problem 653: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.999 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.999 = -289166.54 J/mol = -289.17 kJ/mol.

Problem 654: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.233 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.233 = -118966.41 J/mol = -118.97 kJ/mol.

Problem 655: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.916 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.916 = -265141.69 J/mol = -265.14 kJ/mol.

Problem 656: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.649 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.649 = -187856.94 J/mol = -187.86 kJ/mol.

Problem 657: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.247 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×0.247 = -23831.88 J/mol = -23.83 kJ/mol.

Problem 658: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.098 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -2\times96485\times1.098 = -211881.79$ J/mol = -211.88 kJ/mol.

Problem 659: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.844$ V and $n = 4$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -4\times96485\times1.844 = -711675.81$ J/mol = -711.68 kJ/mol.

Problem 660: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.671$ V and $n = 1$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -1\times96485\times0.671 = -64741.66$ J/mol = -64.74 kJ/mol.

Problem 661: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.467$ V and $n = 3$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -3\times96485\times1.467 = -424631.95$ J/mol = -424.63 kJ/mol.

Problem 662: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.993$ V and $n = 2$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -2\times96485\times1.993 = -384590.53$ J/mol = -384.59 kJ/mol.

Problem 663: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.449$ V and $n = 3$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -3\times96485\times1.449 = -419421.74$ J/mol = -419.42 kJ/mol.

Problem 664: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 0.56$ V and $n = 4$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -4\times96485\times0.560 = -216127.14$ J/mol = -216.13 kJ/mol.

Problem 665: Electrochemistry - ΔG and E

A cell has standard potential $E^\circ = 1.735$ V and $n = 2$. Calculate ΔG° at 298 K.

Solution:

$\Delta G^\circ = -nFE^\circ = -2\times96485\times1.735 = -334804.10$ J/mol = -334.80 kJ/mol.

Problem 666: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.511 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×0.511 = -197216.02 J/mol = -197.22 kJ/mol.

Problem 667: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.995 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.995 = -769952.95 J/mol = -769.95 kJ/mol.

Problem 668: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.402 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.402 = -405817.31 J/mol = -405.82 kJ/mol.

Problem 669: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.19 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.190 = -114817.55 J/mol = -114.82 kJ/mol.

Problem 670: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.804 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.804 = -522178.62 J/mol = -522.18 kJ/mol.

Problem 671: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.481 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.481 = -285789.55 J/mol = -285.79 kJ/mol.

Problem 672: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.629 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.629 = -314349.21 J/mol = -314.35 kJ/mol.

Problem 673: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.418 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times0.418 = -80661.74$ J/mol = -80.66 kJ/mol.

Problem 674: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.626 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times1.626 = -313770.30$ J/mol = -313.77 kJ/mol.

Problem 675: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.623 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times1.623 = -313191.39$ J/mol = -313.19 kJ/mol.

Problem 676: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.85 V and n = 1. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -1\times96485\times0.850 = -82012.53$ J/mol = -82.01 kJ/mol.

Problem 677: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.041 V and n = 3. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -3\times96485\times1.041 = -301323.69$ J/mol = -301.32 kJ/mol.

Problem 678: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.302 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times1.302 = -251247.80$ J/mol = -251.25 kJ/mol.

Problem 679: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.318 V and n = 1. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -1\times96485\times0.318 = -30682.34$ J/mol = -30.68 kJ/mol.

Problem 680: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.999 V and n = 4. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -4\times96485\times1.999 = -771496.72$ J/mol = -771.50 kJ/mol.

Problem 681: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.146 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.146 = -442288.76 J/mol = -442.29 kJ/mol.

Problem 682: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.682 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.682 = -649153.31 J/mol = -649.15 kJ/mol.

Problem 683: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.426 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×0.426 = -41102.75 J/mol = -41.10 kJ/mol.

Problem 684: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.356 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.356 = -392502.33 J/mol = -392.50 kJ/mol.

Problem 685: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.038 V and n = 4. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -4×96485×1.038 = -400607.10 J/mol = -400.61 kJ/mol.

Problem 686: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.431 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×0.431 = -124755.53 J/mol = -124.76 kJ/mol.

Problem 687: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.582 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.582 = -305279.59 J/mol = -305.28 kJ/mol.

Problem 688: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.979 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times0.979 = -188918.28$ J/mol = -188.92 kJ/mol.

Problem 689: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.697 V and n = 1. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -1\times96485\times1.697 = -163735.61$ J/mol = -163.74 kJ/mol.

Problem 690: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.747 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times0.747 = -144149.09$ J/mol = -144.15 kJ/mol.

Problem 691: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.781 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times0.781 = -150710.09$ J/mol = -150.71 kJ/mol.

Problem 692: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.823 V and n = 2. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -2\times96485\times0.823 = -158814.86$ J/mol = -158.81 kJ/mol.

Problem 693: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.723 V and n = 3. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -3\times96485\times1.723 = -498732.68$ J/mol = -498.73 kJ/mol.

Problem 694: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.553 V and n = 3. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -3\times96485\times0.553 = -160069.17$ J/mol = -160.07 kJ/mol.

Problem 695: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.425 V and n = 3. Calculate ΔG° at 298 K.

Solution:

$\Delta G° = -nFE° = -3\times96485\times0.425 = -123018.80$ J/mol = -123.02 kJ/mol.

Problem 696: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.306 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.306 = -378029.53 J/mol = -378.03 kJ/mol.

Problem 697: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.105 V and n = 1. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -1×96485×1.105 = -106616.29 J/mol = -106.62 kJ/mol.

Problem 698: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.265 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×1.265 = -244107.89 J/mol = -244.11 kJ/mol.

Problem 699: Electrochemistry - ΔG and E

A cell has standard potential E° = 0.508 V and n = 2. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -2×96485×0.508 = -98029.10 J/mol = -98.03 kJ/mol.

Problem 700: Electrochemistry - ΔG and E

A cell has standard potential E° = 1.717 V and n = 3. Calculate ΔG° at 298 K.

Solution:

ΔG° = -nFE° = -3×96485×1.717 = -496995.95 J/mol = -497.00 kJ/mol.

Problem 701: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.585 bar, PH2=1.659 bar, PNH3=0.038 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.038^2)/(0.585×1.659^3) = 5.4060e-04.

Problem 702: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.093 bar, PH2=1.301 bar, PNH3=0.581 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.581^2)/(0.093×1.301^3) = 1.6483e+00.

Problem 703: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.669 bar, PH2=1.546 bar, PNH3=0.422 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.422^2)/(0.669×1.546^3) = 7.2039e-02.

Problem 704: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.657 bar, PH2=1.021 bar, PNH3=0.631 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.631^2)/(0.657×1.021^3) = 5.6940e-01.

Problem 705: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.325 bar, PH2=1.915 bar, PNH3=0.488 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.488^2)/(0.325×1.915^3) = 1.0434e-01.

Problem 706: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.814 bar, PH2=1.386 bar, PNH3=0.304 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.304^2)/(0.814×1.386^3) = 4.2642e-02.

Problem 707: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.119 bar, PH2=0.167 bar, PNH3=0.445 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.445^2)/(0.119×0.167^3) = 3.5729e+02.

Problem 708: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.51 bar, PH2=0.448 bar, PNH3=0.611 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.611^2)/(0.51×0.448^3) = 8.1410e+00.

Problem 709: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.347 bar, PH2=1.451 bar, PNH3=0.737 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.737^2)/(0.347×1.451^3) = 5.1239e-01.

Problem 710: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.868 bar, PH2=1.952 bar, PNH3=0.139 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.139^2)/(0.868×1.952^3) = 2.9927e-03.

Problem 711: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.402 bar, PH2=1.145 bar, PNH3=0.326 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.326^2)/(0.402×1.145^3) = 1.7611e-01.

Problem 712: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.493 bar, PH2=0.572 bar, PNH3=0.255 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.255^2)/(0.493×0.572^3) = 7.0477e-01.

Problem 713: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.142 bar, PH2=0.616 bar, PNH3=0.39 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.39^2)/(0.142×0.616^3) = 4.5825e+00.

Problem 714: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.635 bar, PH2=0.534 bar, PNH3=0.867 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.867^2)/(0.635×0.534^3) = 7.7739e+00.

Problem 715: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.202 bar, PH2=0.688 bar, PNH3=0.582 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.582^2)/(0.202×0.688^3) = 5.1491e+00.

Problem 716: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.347 bar, PH2=1.538 bar, PNH3=0.503 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.503^2)/(0.347×1.538^3) = 2.0042e-01.

Problem 717: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.539 bar, PH2=1.023 bar, PNH3=0.315 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.315^2)/(0.539×1.023^3) = 1.7195e-01.

Problem 718: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.072 bar, PH2=1.893 bar, PNH3=0.51 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.51^2)/(0.072×1.893^3) = 5.3254e-01.

Problem 719: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.968 bar, PH2=0.47 bar, PNH3=0.359 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.359^2)/(0.968×0.47^3) = 1.2824e+00.

Problem 720: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.098 bar, PH2=1.015 bar, PNH3=0.884 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.884^2)/(0.098×1.015^3) = 7.6257e+00.

Problem 721: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.672 bar, PH2=0.968 bar, PNH3=0.541 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.541^2)/(0.672×0.968^3) = 4.8017e-01.

Problem 722: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.855 bar, PH2=0.89 bar, PNH3=0.884 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.884^2)/(0.855×0.89^3) = 1.2965e+00.

Problem 723: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.741 bar, PH2=1.54 bar, PNH3=0.372 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.372^2)/(0.741×1.54^3) = 5.1133e-02.

Problem 724: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.431 bar, PH2=1.162 bar, PNH3=0.203 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.203^2)/(0.431×1.162^3) = 6.0939e-02.

Problem 725: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.576 bar, PH2=0.193 bar, PNH3=0.509 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.509^2)/(0.576×0.193^3) = 6.2566e+01.

Problem 726: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.776 bar, PH2=0.595 bar, PNH3=0.989 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.989^2)/(0.776×0.595^3) = 5.9838e+00.

Problem 727: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.696 bar, PH2=0.282 bar, PNH3=0.975 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.975^2)/(0.696×0.282^3) = 6.0905e+01.

Problem 728: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.424 bar, PH2=1.6 bar, PNH3=0.346 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.346^2)/(0.424×1.6^3) = 6.8933e-02.

Problem 729: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.942 bar, PH2=1.522 bar, PNH3=0.207 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.207^2)/(0.942×1.522^3) = 1.2902e-02.

Problem 730: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.534 bar, PH2=1.025 bar, PNH3=0.055 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.055^2)/(0.534×1.025^3) = 5.2603e-03.

Problem 731: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.18 bar, PH2=0.699 bar, PNH3=0.479 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.479^2)/(0.18×0.699^3) = 3.7322e+00.

Problem 732: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.484 bar, PH2=1.232 bar, PNH3=0.52 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.52^2)/(0.484×1.232^3) = 2.9876e-01.

Problem 733: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.362 bar, PH2=1.245 bar, PNH3=0.171 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.171^2)/(0.362×1.245^3) = 4.1858e-02.

Problem 734: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.991 bar, PH2=1.492 bar, PNH3=0.306 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.306^2)/(0.991×1.492^3) = 2.8449e-02.

Problem 735: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.37 bar, PH2=1.665 bar, PNH3=0.537 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.537^2)/(0.37×1.665^3) = 1.6885e-01.

Problem 736: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.723 bar, PH2=0.635 bar, PNH3=0.818 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.818^2)/(0.723×0.635^3) = 3.6145e+00.

Problem 737: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.4 bar, PH2=1.364 bar, PNH3=0.98 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.98^2)/(0.4×1.364^3) = 9.4613e-01.

Problem 738: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.605 bar, PH2=1.604 bar, PNH3=0.728 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.728^2)/(0.605×1.604^3) = 2.1227e-01.

Problem 739: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.704 bar, PH2=0.102 bar, PNH3=0.48 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.48^2)/(0.704×0.102^3) = 3.0840e+02.

Problem 740: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.969 bar, PH2=1.577 bar, PNH3=0.778 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.778^2)/(0.969×1.577^3) = 1.5927e-01.

Problem 741: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.599 bar, PH2=1.457 bar, PNH3=0.588 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.588^2)/(0.599×1.457^3) = 1.8662e-01.

Problem 742: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.212 bar, PH2=1.277 bar, PNH3=0.624 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.624^2)/(0.212×1.277^3) = 8.8198e-01.

Problem 743: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.849 bar, PH2=0.338 bar, PNH3=0.684 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.684^2)/(0.849×0.338^3) = 1.4271e+01.

Problem 744: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.08 bar, PH2=1.899 bar, PNH3=0.119 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.119^2)/(0.08×1.899^3) = 2.5848e-02.

Problem 745: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.068 bar, PH2=0.662 bar, PNH3=0.16 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.16^2)/(0.068×0.662^3) = 1.2976e+00.

Problem 746: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.706 bar, PH2=0.85 bar, PNH3=0.777 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.777^2)/(0.706×0.85^3) = 1.3925e+00.

Problem 747: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.924 bar, PH2=1.752 bar, PNH3=0.738 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.738^2)/(0.924×1.752^3) = 1.0961e-01.

Problem 748: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.109 bar, PH2=0.319 bar, PNH3=0.215 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.215^2)/(0.109×0.319^3) = 1.3064e+01.

Problem 749: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.359 bar, PH2=1.341 bar, PNH3=0.53 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.53^2)/(0.359×1.341^3) = 3.2447e-01.

Problem 750: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.348 bar, PH2=0.388 bar, PNH3=0.913 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.913^2)/(0.348×0.388^3) = 4.1008e+01.

Problem 751: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.375 bar, PH2=0.741 bar, PNH3=0.774 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.774^2)/(0.375×0.741^3) = 3.9264e+00.

Problem 752: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.735 bar, PH2=1.304 bar, PNH3=0.696 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.696^2)/(0.735×1.304^3) = 2.9723e-01.

Problem 753: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.63 bar, PH2=0.425 bar, PNH3=0.254 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.254^2)/(0.63×0.425^3) = 1.3340e+00.

Problem 754: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.58 bar, PH2=0.488 bar, PNH3=0.973 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.973^2)/(0.58×0.488^3) = 1.4046e+01.

Problem 755: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.333 bar, PH2=0.614 bar, PNH3=0.215 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.215^2)/(0.333×0.614^3) = 5.9969e-01.

Problem 756: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.72 bar, PH2=0.668 bar, PNH3=0.355 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.355^2)/(0.72×0.668^3) = 5.8721e-01.

Problem 757: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.937 bar, PH2=1.601 bar, PNH3=0.281 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.281^2)/(0.937×1.601^3) = 2.0535e-02.

Problem 758: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.166 bar, PH2=1.369 bar, PNH3=0.386 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.386^2)/(0.166×1.369^3) = 3.4983e-01.

Problem 759: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.981 bar, PH2=1.646 bar, PNH3=0.955 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.955^2)/(0.981×1.646^3) = 2.0847e-01.

Problem 760: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.814 bar, PH2=0.616 bar, PNH3=0.295 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.295^2)/(0.814×0.616^3) = 4.5738e-01.

Problem 761: Equilibrium - Kp

For $N_2 + 3 H_2 \rightleftharpoons 2 NH_3$, partial pressures: PN2=0.728 bar, PH2=0.725 bar, PNH3=0.448 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.448^2)/(0.728×0.725^3) = 7.2345e-01.

Problem 762: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.294 bar, PH2=0.984 bar, PNH3=0.21 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.21^2)/(0.294×0.984^3) = 1.5744e-01.

Problem 763: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.562 bar, PH2=1.869 bar, PNH3=0.699 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.699^2)/(0.562×1.869^3) = 1.3317e-01.

Problem 764: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.18 bar, PH2=1.251 bar, PNH3=0.591 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.591^2)/(0.18×1.251^3) = 9.9113e-01.

Problem 765: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.28 bar, PH2=1.356 bar, PNH3=0.536 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.536^2)/(0.28×1.356^3) = 4.1152e-01.

Problem 766: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.656 bar, PH2=0.152 bar, PNH3=0.419 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.419^2)/(0.656×0.152^3) = 7.6207e+01.

Problem 767: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.731 bar, PH2=0.246 bar, PNH3=0.773 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.773^2)/(0.731×0.246^3) = 5.4908e+01.

Problem 768: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.055 bar, PH2=1.123 bar, PNH3=0.93 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.93^2)/(0.055×1.123^3) = 1.1104e+01.

Problem 769: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.437 bar, PH2=1.873 bar, PNH3=0.88 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.88^2)/(0.437×1.873^3) = 2.6969e-01.

Problem 770: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.504 bar, PH2=0.439 bar, PNH3=0.964 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.964^2)/(0.504×0.439^3) = 2.1794e+01.

Problem 771: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.355 bar, PH2=1.31 bar, PNH3=0.909 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.909^2)/(0.355×1.31^3) = 1.0353e+00.

Problem 772: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.135 bar, PH2=1.17 bar, PNH3=0.54 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.54^2)/(0.135×1.17^3) = 1.3486e+00.

Problem 773: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.737 bar, PH2=1.877 bar, PNH3=0.914 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.914^2)/(0.737×1.877^3) = 1.7141e-01.

Problem 774: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.216 bar, PH2=1.77 bar, PNH3=0.184 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.184^2)/(0.216×1.77^3) = 2.8266e-02.

Problem 775: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.924 bar, PH2=1.994 bar, PNH3=0.403 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.403^2)/(0.924×1.994^3) = 2.2170e-02.

Problem 776: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.521 bar, PH2=1.876 bar, PNH3=0.963 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.963^2)/(0.521×1.876^3) = 2.6960e-01.

Problem 777: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.93 bar, PH2=1.76 bar, PNH3=0.019 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.019^2)/(0.93×1.76^3) = 7.1201e-05.

Problem 778: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.59 bar, PH2=0.259 bar, PNH3=0.983 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.983^2)/(0.59×0.259^3) = 9.4266e+01.

Problem 779: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.32 bar, PH2=1.979 bar, PNH3=0.548 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.548^2)/(0.32×1.979^3) = 1.2108e-01.

Problem 780: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.519 bar, PH2=1.88 bar, PNH3=0.853 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.853^2)/(0.519×1.88^3) = 2.1099e-01.

Problem 781: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.495 bar, PH2=0.426 bar, PNH3=0.122 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.122^2)/(0.495×0.426^3) = 3.8894e-01.

Problem 782: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.204 bar, PH2=0.945 bar, PNH3=0.265 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.265^2)/(0.204×0.945^3) = 4.0791e-01.

Problem 783: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.227 bar, PH2=1.486 bar, PNH3=0.793 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.793^2)/(0.227×1.486^3) = 8.4424e-01.

Problem 784: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.589 bar, PH2=1.527 bar, PNH3=0.184 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.184^2)/(0.589×1.527^3) = 1.6144e-02.

Problem 785: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.863 bar, PH2=1.799 bar, PNH3=0.829 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.829^2)/(0.863×1.799^3) = 1.3677e-01.

Problem 786: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.54 bar, PH2=0.219 bar, PNH3=0.673 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.673^2)/(0.54×0.219^3) = 7.9855e+01.

Problem 787: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.226 bar, PH2=0.324 bar, PNH3=0.33 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.33^2)/(0.226×0.324^3) = 1.4167e+01.

Problem 788: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.286 bar, PH2=0.559 bar, PNH3=0.243 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.243^2)/(0.286×0.559^3) = 1.1820e+00.

Problem 789: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.766 bar, PH2=1.91 bar, PNH3=0.309 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.309^2)/(0.766×1.91^3) = 1.7889e-02.

Problem 790: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.737 bar, PH2=0.072 bar, PNH3=0.657 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.657^2)/(0.737×0.072^3) = 1.5692e+03.

Problem 791: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.708 bar, PH2=0.171 bar, PNH3=0.127 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.127^2)/(0.708×0.171^3) = 4.5560e+00.

Problem 792: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.341 bar, PH2=0.841 bar, PNH3=0.507 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.507^2)/(0.341×0.841^3) = 1.2673e+00.

Problem 793: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.9 bar, PH2=1.422 bar, PNH3=0.318 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.318^2)/(0.9×1.422^3) = 3.9076e-02.

Problem 794: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.162 bar, PH2=1.836 bar, PNH3=0.302 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.302^2)/(0.162×1.836^3) = 9.0966e-02.

Problem 795: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.634 bar, PH2=0.477 bar, PNH3=0.142 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.142^2)/(0.634×0.477^3) = 2.9304e-01.

Problem 796: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.196 bar, PH2=1.508 bar, PNH3=0.61 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.61^2)/(0.196×1.508^3) = 5.5360e-01.

Problem 797: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.445 bar, PH2=1.121 bar, PNH3=0.476 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.476^2)/(0.445×1.121^3) = 3.6144e-01.

Problem 798: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.561 bar, PH2=1.345 bar, PNH3=0.226 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.226^2)/(0.561×1.345^3) = 3.7419e-02.

Problem 799: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.285 bar, PH2=1.522 bar, PNH3=0.874 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.874^2)/(0.285×1.522^3) = 7.6021e-01.

Problem 800: Equilibrium - Kp

For N2 + 3 H2 ⇌ 2 NH3, partial pressures: PN2=0.128 bar, PH2=0.921 bar, PNH3=0.707 bar. Calculate Kp.

Solution:

Kp = P_NH3^2 / (P_N2·P_H2^3) = (0.707^2)/(0.128×0.921^3) = 4.9986e+00.

Problem 801: Phase rule

For a system with C = 1 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 1 + 2 = 2.

Problem 802: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 803: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 2 + 2 = 3.

Problem 804: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 805: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 806: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 807: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 808: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 809: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 810: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 811: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 812: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 813: Phase rule

For a system with C = 3 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 3 + 2 = 2.

Problem 814: Phase rule

For a system with C = 3 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 1 + 2 = 4.

Problem 815: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 816: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 817: Phase rule

For a system with C = 3 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 1 + 2 = 4.

Problem 818: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 819: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 820: Phase rule

For a system with C = 3 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 1 + 2 = 4.

Problem 821: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 822: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 823: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 824: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 825: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 826: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 827: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 828: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 2 + 2 = 3.

Problem 829: Phase rule

For a system with C = 3 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 3 + 2 = 2.

Problem 830: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 831: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 832: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 2 + 2 = 3.

Problem 833: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 2 + 2 = 3.

Problem 834: Phase rule

For a system with C = 1 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 1 + 2 = 2.

Problem 835: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 836: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 837: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 838: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 839: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 840: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 841: Phase rule

For a system with C = 1 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 1 + 2 = 2.

Problem 842: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 843: Phase rule

For a system with C = 3 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 1 + 2 = 4.

Problem 844: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 845: Phase rule

For a system with C = 1 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 1 + 2 = 2.

Problem 846: Phase rule

For a system with C = 3 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 1 + 2 = 4.

Problem 847: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 848: Phase rule

For a system with C = 1 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 1 + 2 = 2.

Problem 849: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 850: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 851: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 852: Phase rule

For a system with C = 3 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 3 + 2 = 2.

Problem 853: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 854: Phase rule

For a system with C = 3 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 3 + 2 = 2.

Problem 855: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 856: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 857: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 858: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 859: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 2 + 2 = 3.

Problem 860: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 861: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 862: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 863: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 864: Phase rule

For a system with C = 3 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 3 + 2 = 2.

Problem 865: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 866: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 867: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 868: Phase rule

For a system with C = 1 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 4 + 2 = -1.

Problem 869: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 870: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 871: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 872: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 873: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 874: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 875: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 876: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 877: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 878: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 879: Phase rule

For a system with C = 1 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 3 + 2 = 0.

Problem 880: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 881: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 882: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 2 + 2 = 3.

Problem 883: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 884: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 885: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 886: Phase rule

For a system with C = 1 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 1 + 2 = 2.

Problem 887: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 888: Phase rule

For a system with C = 1 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 1 - 2 + 2 = 1.

Problem 889: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 890: Phase rule

For a system with C = 3 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 3 + 2 = 2.

Problem 891: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 892: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 893: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 3 + 2 = 1.

Problem 894: Phase rule

For a system with C = 2 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 4 + 2 = 0.

Problem 895: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 1 + 2 = 3.

Problem 896: Phase rule

For a system with C = 3 components and P = 4 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 3 - 4 + 2 = 1.

Problem 897: Phase rule

For a system with C = 2 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: F = C - P + 2 = 2 - 2 + 2 = 2.

Problem 898: Phase rule

For a system with C = 2 components and P = 3 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: $F = C - P + 2 = 2 - 3 + 2 = 1$.

Problem 899: Phase rule

For a system with C = 2 components and P = 1 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: $F = C - P + 2 = 2 - 1 + 2 = 3$.

Problem 900: Phase rule

For a system with C = 3 components and P = 2 phases, calculate degrees of freedom using Gibbs phase rule.

Solution:

Gibbs phase rule: $F = C - P + 2 = 3 - 2 + 2 = 3$.

Problem 901: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 2.5 L at 273 K (use $R = 0.08314\ \mathrm{L{\cdot}bar{\cdot}mol^{-1}{\cdot}K^{-1}}$).

Solution:

$P = nRT/V = (3.0\times0.08314\times273)/2.5 = 27.2367$ bar (ideal gas approximation).

Problem 902: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 350 K (use $R = 0.08314\ \mathrm{L{\cdot}bar{\cdot}mol^{-1}{\cdot}K^{-1}}$).

Solution:

$P = nRT/V = (2.0\times0.08314\times350)/20.0 = 2.9099$ bar (ideal gas approximation).

Problem 903: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 298 K (use $R = 0.08314\ \mathrm{L{\cdot}bar{\cdot}mol^{-1}{\cdot}K^{-1}}$).

Solution:

$P = nRT/V = (2.0\times0.08314\times298)/2.5 = 19.8206$ bar (ideal gas approximation).

Problem 904: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 350 K (use $R = 0.08314\ \mathrm{L{\cdot}bar{\cdot}mol^{-1}{\cdot}K^{-1}}$).

Solution:

$P = nRT/V = (2.0\times0.08314\times350)/2.5 = 23.2792$ bar (ideal gas approximation).

Problem 905: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 2.5 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×350)/2.5 = 34.9188 bar (ideal gas approximation).

Problem 906: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 5.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×300)/5.0 = 14.9652 bar (ideal gas approximation).

Problem 907: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/10.0 = 5.8198 bar (ideal gas approximation).

Problem 908: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 5.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×298)/5.0 = 4.9551 bar (ideal gas approximation).

Problem 909: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×350)/20.0 = 1.4549 bar (ideal gas approximation).

Problem 910: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×273)/20.0 = 1.1349 bar (ideal gas approximation).

Problem 911: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 1.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×273)/1.0 = 68.0917 bar (ideal gas approximation).

Problem 912: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 1.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×273)/1.0 = 68.0917 bar (ideal gas approximation).

Problem 913: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/2.5 = 19.8206 bar (ideal gas approximation).

Problem 914: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 2.5 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×273)/2.5 = 9.0789 bar (ideal gas approximation).

Problem 915: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×350)/20.0 = 1.4549 bar (ideal gas approximation).

Problem 916: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/1.0 = 58.1980 bar (ideal gas approximation).

Problem 917: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×273)/10.0 = 6.8092 bar (ideal gas approximation).

Problem 918: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×350)/20.0 = 1.4549 bar (ideal gas approximation).

Problem 919: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 1.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×300)/1.0 = 24.9420 bar (ideal gas approximation).

Problem 920: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 5.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×273)/5.0 = 13.6183 bar (ideal gas approximation).

Problem 921: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/10.0 = 7.4327 bar (ideal gas approximation).

Problem 922: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 1.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×298)/1.0 = 24.7757 bar (ideal gas approximation).

Problem 923: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 2.5 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×300)/2.5 = 9.9768 bar (ideal gas approximation).

Problem 924: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/5.0 = 11.6396 bar (ideal gas approximation).

Problem 925: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 5.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×350)/5.0 = 5.8198 bar (ideal gas approximation).

Problem 926: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/20.0 = 2.4776 bar (ideal gas approximation).

Problem 927: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 2.5 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0 \times 0.08314 \times 300)/2.5 = 29.9304$ bar (ideal gas approximation).

Problem 928: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 1.0 L at 273 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (3.0 \times 0.08314 \times 273)/1.0 = 68.0917$ bar (ideal gas approximation).

Problem 929: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 10.0 L at 350 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (1.0 \times 0.08314 \times 350)/10.0 = 2.9099$ bar (ideal gas approximation).

Problem 930: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 350 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (2.0 \times 0.08314 \times 350)/20.0 = 2.9099$ bar (ideal gas approximation).

Problem 931: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 1.0 L at 298 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (1.0 \times 0.08314 \times 298)/1.0 = 24.7757$ bar (ideal gas approximation).

Problem 932: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 10.0 L at 350 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (1.0 \times 0.08314 \times 350)/10.0 = 2.9099$ bar (ideal gas approximation).

Problem 933: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 5.0 L at 273 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (3.0 \times 0.08314 \times 273)/5.0 = 13.6183$ bar (ideal gas approximation).

Problem 934: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 1.0 L at 298 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (3.0 \times 0.08314 \times 298)/1.0 = 74.3272$ bar (ideal gas approximation).

Problem 935: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 350 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (1.0×0.08314×350)/20.0 = 1.4549$ bar (ideal gas approximation).

Problem 936: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 273 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (2.0×0.08314×273)/1.0 = 45.3944$ bar (ideal gas approximation).

Problem 937: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 5.0 L at 273 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0×0.08314×273)/5.0 = 13.6183$ bar (ideal gas approximation).

Problem 938: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 5.0 L at 273 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (1.0×0.08314×273)/5.0 = 4.5394$ bar (ideal gas approximation).

Problem 939: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 298 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (1.0×0.08314×298)/20.0 = 1.2388$ bar (ideal gas approximation).

Problem 940: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 273 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0×0.08314×273)/10.0 = 6.8092$ bar (ideal gas approximation).

Problem 941: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 298 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (2.0×0.08314×298)/2.5 = 19.8206$ bar (ideal gas approximation).

Problem 942: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 300 K (use $R = 0.08314$ L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0 \times 0.08314 \times 300)/10.0 = 7.4826$ bar (ideal gas approximation).

Problem 943: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 273 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (2.0 \times 0.08314 \times 273)/2.5 = 18.1578$ bar (ideal gas approximation).

Problem 944: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 5.0 L at 273 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (3.0 \times 0.08314 \times 273)/5.0 = 13.6183$ bar (ideal gas approximation).

Problem 945: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 10.0 L at 298 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (1.0 \times 0.08314 \times 298)/10.0 = 2.4776$ bar (ideal gas approximation).

Problem 946: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 5.0 L at 350 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (1.0 \times 0.08314 \times 350)/5.0 = 5.8198$ bar (ideal gas approximation).

Problem 947: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 300 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (2.0 \times 0.08314 \times 300)/1.0 = 49.8840$ bar (ideal gas approximation).

Problem 948: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 298 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (2.0 \times 0.08314 \times 298)/10.0 = 4.9551$ bar (ideal gas approximation).

Problem 949: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 350 K (use $R = 0.08314\ \mathrm{L \cdot bar \cdot mol^{-1} \cdot K^{-1}}$).

Solution:

$P = nRT/V = (2.0 \times 0.08314 \times 350)/20.0 = 2.9099$ bar (ideal gas approximation).

Problem 950: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/2.5 = 23.2792 bar (ideal gas approximation).

Problem 951: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×300)/20.0 = 1.2471 bar (ideal gas approximation).

Problem 952: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 1.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×273)/1.0 = 22.6972 bar (ideal gas approximation).

Problem 953: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/2.5 = 23.2792 bar (ideal gas approximation).

Problem 954: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 2.5 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×350)/2.5 = 34.9188 bar (ideal gas approximation).

Problem 955: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×273)/5.0 = 9.0789 bar (ideal gas approximation).

Problem 956: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 1.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×300)/1.0 = 24.9420 bar (ideal gas approximation).

Problem 957: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×300)/5.0 = 9.9768 bar (ideal gas approximation).

Problem 958: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 2.5 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×273)/2.5 = 9.0789 bar (ideal gas approximation).

Problem 959: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 10.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×350)/10.0 = 2.9099 bar (ideal gas approximation).

Problem 960: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×350)/20.0 = 4.3649 bar (ideal gas approximation).

Problem 961: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 1.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×273)/1.0 = 22.6972 bar (ideal gas approximation).

Problem 962: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×273)/20.0 = 2.2697 bar (ideal gas approximation).

Problem 963: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×300)/20.0 = 3.7413 bar (ideal gas approximation).

Problem 964: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×300)/1.0 = 49.8840 bar (ideal gas approximation).

Problem 965: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×273)/10.0 = 4.5394 bar (ideal gas approximation).

Problem 966: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/20.0 = 3.7164 bar (ideal gas approximation).

Problem 967: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/20.0 = 3.7164 bar (ideal gas approximation).

Problem 968: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/10.0 = 7.4327 bar (ideal gas approximation).

Problem 969: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 5.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×300)/5.0 = 4.9884 bar (ideal gas approximation).

Problem 970: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/10.0 = 4.9551 bar (ideal gas approximation).

Problem 971: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 2.5 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (1.0×0.08314×350)/2.5 = 11.6396 bar (ideal gas approximation).

Problem 972: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:
$P = nRT/V = (2.0\times0.08314\times300)/10.0 = 4.9884$ bar (ideal gas approximation).

Problem 973: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 300 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (2.0\times0.08314\times300)/1.0 = 49.8840$ bar (ideal gas approximation).

Problem 974: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 350 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (2.0\times0.08314\times350)/2.5 = 23.2792$ bar (ideal gas approximation).

Problem 975: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 298 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (3.0\times0.08314\times298)/20.0 = 3.7164$ bar (ideal gas approximation).

Problem 976: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 298 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (2.0\times0.08314\times298)/1.0 = 49.5514$ bar (ideal gas approximation).

Problem 977: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 350 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (2.0\times0.08314\times350)/1.0 = 58.1980$ bar (ideal gas approximation).

Problem 978: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 350 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (2.0\times0.08314\times350)/20.0 = 2.9099$ bar (ideal gas approximation).

Problem 979: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 300 K (use $R = 0.08314\ \mathrm{L\cdot bar\cdot mol^{-1}\cdot K^{-1}}$).

Solution:
$P = nRT/V = (2.0\times0.08314\times300)/10.0 = 4.9884$ bar (ideal gas approximation).

Problem 980: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 20.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/20.0 = 2.4776 bar (ideal gas approximation).

Problem 981: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/5.0 = 9.9103 bar (ideal gas approximation).

Problem 982: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/5.0 = 9.9103 bar (ideal gas approximation).

Problem 983: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×300)/5.0 = 9.9768 bar (ideal gas approximation).

Problem 984: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/10.0 = 7.4327 bar (ideal gas approximation).

Problem 985: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×300)/10.0 = 4.9884 bar (ideal gas approximation).

Problem 986: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×273)/5.0 = 9.0789 bar (ideal gas approximation).

Problem 987: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 2.5 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/2.5 = 29.7309 bar (ideal gas approximation).

Problem 988: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×273)/20.0 = 3.4046 bar (ideal gas approximation).

Problem 989: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/10.0 = 7.4327 bar (ideal gas approximation).

Problem 990: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 5.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×273)/5.0 = 9.0789 bar (ideal gas approximation).

Problem 991: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 10.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×298)/10.0 = 4.9551 bar (ideal gas approximation).

Problem 992: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 5.0 L at 298 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (3.0×0.08314×298)/5.0 = 14.8654 bar (ideal gas approximation).

Problem 993: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 2.5 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/2.5 = 23.2792 bar (ideal gas approximation).

Problem 994: Ideal gas law

Calculate pressure of 2.0 mol ideal gas in 1.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

P = nRT/V = (2.0×0.08314×350)/1.0 = 58.1980 bar (ideal gas approximation).

Problem 995: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 10.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0\times0.08314\times350)/10.0 = 8.7297$ bar (ideal gas approximation).

Problem 996: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 350 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0\times0.08314\times350)/20.0 = 4.3649$ bar (ideal gas approximation).

Problem 997: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 1.0 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0\times0.08314\times300)/1.0 = 74.8260$ bar (ideal gas approximation).

Problem 998: Ideal gas law

Calculate pressure of 3.0 mol ideal gas in 20.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (3.0\times0.08314\times273)/20.0 = 3.4046$ bar (ideal gas approximation).

Problem 999: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 2.5 L at 300 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (1.0\times0.08314\times300)/2.5 = 9.9768$ bar (ideal gas approximation).

Problem 1000: Ideal gas law

Calculate pressure of 1.0 mol ideal gas in 20.0 L at 273 K (use R = 0.08314 L·bar·mol^{-1}·K^{-1}).

Solution:

$P = nRT/V = (1.0\times0.08314\times273)/20.0 = 1.1349$ bar (ideal gas approximation).