國立聯合大學 105 學年度

暑假轉學生招生考試試題紙

科目：物理化學第 1 頁共 1 頁

Symbol : Heat q, internal energy U, enthalpy H, entropy S

Equilibrium constant K_P. Gibbs free energy G.

選擇最接近之答案

1. Two moles ideal gas adiabatically and reversibly compressed. Temperature changes from 10°C to 50°C. C_V =3R/2. Calculate ΔU. (a) 60R (b)100R (c) 120R (d) 200R.
2. Two moles ideal gas adiabatically and reversibly compressed. Temperature changes from 10°C to 50°C. C_V =3R/2. Calculate ΔH. (a) 60R (b)100R (c) 120R (d) 200R.
3. Two moles ideal gas adiabatically and reversibly compressed. Temperature changes from 10°C to 50°C. C_V =3R/2. Calculate ΔS . (a) 1.5R (b) 2.5R (c) 0 (d) –1.5R.
4. Two moles ideal gas at 250 K, C_V =3R/2 expands isothermally and reversibly from 5 L to 25 L Calculate ΔS. (a) R ln 5 (b)2 R ln 5 (c) 3R ln 5 (d) –3R ln 5.
5. Two moles ideal gas at 250 K, C_V =3R/2 expands isothermally and reversibly from 5 L to 25 L. Calculate q. (a) 250R ln 5 (b)500R ln 5 (c) 750R ln 5 (d) –750R ln 5.
6. $NO_2(g) \leftrightarrow NO(g) + (1/2)O_2(g)$

   Initially only NO_2 is present. At 800K, the total pressure is 1 bar and P_{NO}/P_{NO2} =2.50.

   What is the value K_P. (a) 1.284 (b)0.659 (c) 0.488 (d) 0.366
7. $NO_2(g) \leftrightarrow NO(g) + (1/2)O_2(g)$

   Initially only NO_2 is present. At 800K, the total pressure is 1 bar and P_{NO}/P_{NO2} =2.50.

   What is the value ΔG°. (a) –200R (b)–300R (c) –400R (d) –500R.
8. A(g) ↔ B(g) is a reversible reaction.

   At 700K, K_P is 0.380 and at 800K, K_P is 0.19. Assuming ΔH° is independent of temperature, What is the value of ΔH°. (a)1941R (b) 3882R (c)–1941R (d)–3882R
9. The following data are available for water (Sub: sublimation, Vap: vaporization)

   $\ln P^{Sub}$ (ice) = 28.8926-6140.1/T, $\ln P^{Vap}$ (water) = 26.3026-5432.8/T, P in Pa ,T in K

   Compute the triple-point temperature and pressure of water,

   (a) 263 K (b) 273 K (c) 298 K (d) 373 K.
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    $\ln P^{Sub}$ (ice) = 28.8926-6140.1/T, $\ln P^{vap}$ (water) = 26.3026-5432.8/T, P in Pa, T in K

    Compute the heat of fusion of water at its triple point.

    (a) 6140 R (b) 5433 R (c) 707 R (d) –707R.