

SOVARANI MEMORIAL COLLEGE

Internal Assessment - 2021

SEMESTER - 3 (H)

Subject - Chemistry

Paper - CC-3-5

F.M-10

Time - 30 mins

Answer any ten (10) questions ($1 \times 10 = 10$)

- $dH = n C_p dT$ equation is applicable for
a) Ideal gas & Isoberic process ; b) Ideal gas ; c) Isobaric process ; d) all are correct.
- Free expansion of an ideal gas in an adiabatic process must be a) Isothermal ; b) Isochoric ; c) Isobaric ; d) Isoergic
- 10 lit of a monoatomic gas expands adiabatically from 5 atm to 1 atm and final volume is 23.6 lit. What is adiabatic work
a) 968 cal ; b) 368 cal ; c) 200 cal ; d) 305 cal.
- When hot rod cools down then change of Gibbs free energy
i) +ve ; ii) -ve ; (iii) zero ; (iv) high -ve value.
- At 0°C
 $\text{H}_2\text{O}(s) \rightarrow \text{H}_2\text{O}(g) \quad \Delta H = 5000 \text{ J/mol}$
 $\text{H}_2\text{O}(l) \rightarrow \text{H}_2\text{O}(g) \quad \Delta H = 4750 \text{ J/mol}$
 What is ΔS for $\text{H}_2\text{O}(s) \rightarrow \text{H}_2\text{O}(l)$ at 0°C . ?
 a) $0.91 \text{ J K}^{-1} \text{ mol}^{-1}$; b) $0.05 \text{ J K}^{-1} \text{ mol}^{-1}$; c) $0.1 \text{ J K}^{-1} \text{ mol}^{-1}$; d) $0.2 \text{ J K}^{-1} \text{ mol}^{-1}$
- What is the pH of 10^{-8} (M) $\text{Mg}(\text{OH})_2$ solution
a) 7.04 ; b) 6 ; c) 8 ; d) 10.
- Which of the mixture act as a buffer?
a) H_3PO_4 & NaH_2PO_4 ; b) NaH_2PO_4 & Na_2HPO_4 ; c) Na_2HPO_4 & Na_3PO_4
d) NaH_2PO_4 & Na_3PO_4 .
- Given below are the values of ΔH° and ΔS° for the reaction at 27°C
 $\text{SO}_2(g) + \frac{1}{2}\text{O}_2(g) \rightarrow \text{SO}_3(g) \quad \Delta H^\circ = 83.14 \text{ KJ/mol}$
 $\Delta S^\circ = 16.626 \text{ J K}^{-1} \text{ mol}^{-1}$
 Calculate K_p .
 a) $e^{35.33}$; b) $e^{13.07}$; c) $e^{10.3}$; d) $e^{20.5}$.

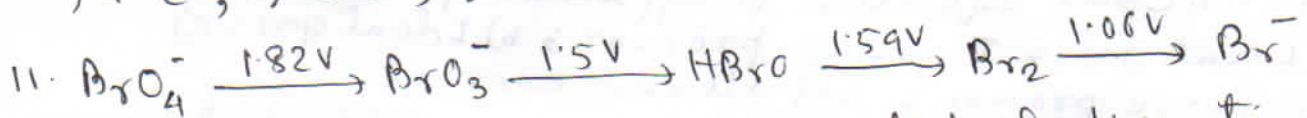
9. Which of the reaction is ~~is~~ correct?

a) $C_p - C_v = \frac{TV\alpha^2}{K}$; b) $C_p - C_v = \frac{TV\alpha}{K^2}$; c) $C_p - C_v = \frac{\alpha^2 K}{T}$

d) $C_p - C_v = \frac{KT}{\alpha^2}$

10. At what temperature $C_p = C_v$?

a) 4°C ; b) 0°C ; c) $T \rightarrow \infty$; d) $T = 100 \text{ K}$



Then the species undergoing disproportionation is

a) HBrO ; b) BrO_3^- ; c) Br_2 ; d) BrO_4^-

12. Ionic mobility of which of the following alkali metal ion is lowest when aqueous solution of their salts are put under electric field

a) K ; b) Rb ; c) Li ; d) Na .

13. The pressure of H_2 required to make the potential of H-electrode zero in pure water at 298 K is

a) 10^{-10} atm ; b) 10^{-4} atm ; c) 10^{-14} atm ; d) 10^{-12} atm