CHEMISTRY

BOOKS - NAGEEN CHEMISTRY (ENGLISH)

SAMPLE QUESTION PAPER -2

Answear The Following

1. (1) Predict the sign of ΔG for a reaction that is exothermic and accompanied by an increase

in entropy.

(2) What does $\Delta H = q_p$ refers to ?

2. (1) What type of hybridization is involved in the formation of each of the C - C single bond, double bond and triple bond?

(2) Name the alkanes with octane numbers 0 and 100.

3. (1) Why is sodium kept under kerosene oil?

(2) Among groups 1 and 2, the elements of which group have higher ionization enthalpies?

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Questions Answers

1. 750 ml of nitrogen are collected over water at $25°C$ and 740 mm pressure. If the aqueous

tension at this temperature is 23.8 mm Hg calculate the mass of the dry gas.

2. Why is Lif almost insoluble in water whereas LiCl soluble not only in water but also in acetone.

3. Among the following sets of quantum numbers, state which are possible. Explain why the others are not permitted?

(i) $n = 1$, $l = 0$, $m = -1$, $s = +1/2$

(ii) $n = 1$, $l = 0$, $m = 0$, $s = -1/2$

(iii) $n = 2$, $l = 3$, $m = 0$, $s = +1/2$

(iv) $n = 3$, $l = 1$, $m = 1$, $s = -1/2$

(v) $n = 0$, $l = 0$, $m = 0$, $s = +1/2$

(vi) $n = 2$, $l = 0$, $m = 0$, $s = -1/2$

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4. A gas cylinder containing cooking gas can withstand a pressure of 14.9 atm. The pressure gauge of the cylinder indicates 12 atm at $27°C$. Due to sudden fire in the building its temperature starts rising. At what temperature cylinder will explode?

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5. A syringe has a volume of 10.0 cm^3 at pressure 1 atm. If you plug the end so that no gas can escape and push the plunger down,

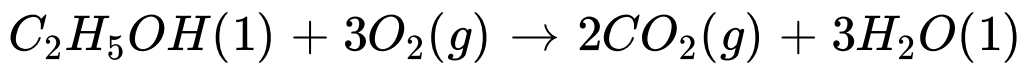what must be the final volume to change the pressure to 3.5 atm?

6. In a chemical reaction 150 g of baking soda mixture containing sodium bicarbonate and vinegar on heating gives 87g of carbon dioxide gas. What mass of solid residue will be left in food?

7. Calculate the standard heat of formation of

$C_2H_2OH(1)$ from the following data:

$C_2H_5OH(1) + 3O_2(g) \rightarrow 2CO_2(g) + 3H_2O(1)$

(i) $\Delta H^\circ = -1366.5 \quad kj \quad mol^{-1}$

(ii)$\Delta_f H^\circ[CO_2(g)] = -393.5 \quad kj \quad mol^{-1}$

(iii) $\Delta H^\circ[H_2O(l)] = -285.5 \quad kj \quad mol^{-1}$

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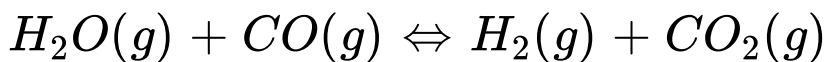**8.** (1) What are diastereomers ? Mention their

important properties.

(ii) Why is dichloroacetic acid stronger than monochloroacetic acid?

9. (i)1 mole of H_2O and 1 mole of CO are taken in a 10 litre vessel and heated to 725K. At equilibrium, 40 percent of water (by mass) reacts with carbon monoxide, according to the equation.

$$H_2O(g) + CO(g) \Leftrightarrow H_2(g) + CO_2(g)$$
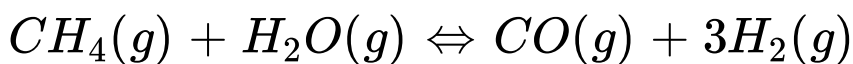
Calculate the equilibrium constant for the

reaction

(ii) The solubility of CaF_2, in water at 298K is 1.7×10^{-3} grams per 100 cm^3. Calculate the solubility product of CaF_2, at 295K.

10. (i) Dihydrogen gas is obtained from natural gas by partial oxidation with steam as per following endothermic reaction

$$CH_4(g) + H_2O(g) \Leftrightarrow CO(g) + 3H_2(g)$$

(1) Write an expression for K_p for the above

reaction.

(2) How will the values of K_p, and composition of equilibrium mixture be affected by:

(I) Increasing the pressure

(II) Increasing the temperature

(III) Using a catalyst?

(ii) A solution of NaOH is prepared by dissolving 15 g of the base in 500 ml of water Calculate the pH of the solution.