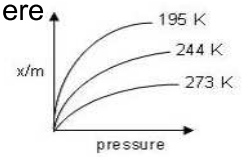
UNIT-5

SURFACE CHEMISTRY

2 Marks Questions

1 Explain how activated charcoal adsorbs organic dye.

2. A graph between log(x/m) and log p is a straight line at angle of 45^0 with intercept on the y-axis(log k) equal to 0.301. Calculate the amount of the gas adsorbed per gram of the adsorbent under a pressure of 0.4 Atmosphere



3 Adsorption is always exothermic in nature. Comment.

4 Critical temperatures of N_2, CO, CH_4 are 126, 134, and 110 K respectively. Arrange them in increasing order of adsorption on the surface of activated charcoal?

5 Consider the adsorption isotherms given below and interpret the variation in the extent of adsorption (x/m) when:
(i) Temperature increases at constant pressure.
(ii) Pressure increases at constant temperature

6 If the flocculation values of NaCl and $AlCl_3$ are respectively 52 and 0.093, compare their coagulating powers.

7. Explain how soap solution stabilizes an emulsion of oil in water?

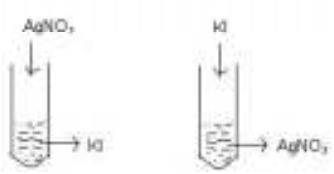
8 What happens when a freshly precipitated $Fe(OH)_3$ is shaken with little dil. $FeCl_3$ solution? Explain with possible reactions.

9 A methanol poisoned patient is treated by giving intravenous infusion of dil. ethanol. Explain.
[Hint: Influence of inhibitors]

10 How does a 'collector' separate the ore from gangue in the froth floatation process?

3 Marks Questions

11 A colloidal solution of AgI is prepared by 2 different methods as shown:



(i) What is the charge of AgI colloidal particles in the two test tubes (A) and (B)?

(ii) Give reasons for the origin of charge.

12 SnO_2 forms a positively charged colloidal sol in the acidic medium and negatively charged sol in basic medium. Explain.

13 1 g of charcoal adsorbs 100 ml of 0.5 M CH_3COOH to form a monolayer and thereby the molarity of acetic acid is reduced to 0.49 M. Calculate the surface area of the charcoal adsorbed by each molecule of acetic acid. Surface area of charcoal = 3.01×10^2 m^2/g.

14 To 100 ml of M/2 oxalic acid solution 2 g of active charcoal is added. After adsorption the strength of solution is reduced to M/4. Calculate the acid adsorbed by 1 g of charcoal.

15 Explain why:

(i) At sunset an orange colour develops in the sky.

(ii) Bleeding due to a small cut can be stopped by rubbing alum.

Activated charcoal is used in gas masks used by coal miners.