## **Surface Chemistry**

## Self Evaluation Test -14

- In which of the following commercial processes a catalyst is not used [CPMT 1989]
  - (a) Haber's process
  - (b) Deacon's process
  - (c) Solvay process
  - (d) Lead chamber process
- 2. A catalyst [IIT 1984; AFMC 1995; CBSE PMT 1995]
  - (a) Increases the average kinetic energy of reacting molecules
  - (b) Increases the activation energy
  - (c) Alters the reaction mechanism
- (d) Increases the frequency of collisions of reacting species  $% \left( 1\right) =\left( 1\right) \left( 1\right$
- 3. The coagulation of 100 ml of a colloidal sol of gold is completely prevented by addition of 0.25 g of a substance `X' to it before adding 10 ml of 1% NaCl solution. The gold number of `X' is
  - (a) 0.25
- (b) 25
- (c) 250
- (d) 2.5
- **4.** Which one of the following is not a property of hydrophilic sols
  - (a) High concentrations of dispersed phase can be easily attained
  - (b) Coagulation is reversible
  - (c) Viscosity and surface tension are about the same as for water
  - (d) The charge of the particle depends on the pH values of the medium; it may be positive, negative or even zero
- 5. Peptising agent is
  - (a) Always an electrolyte
  - (b) Always a non-electrolyte
  - (c) Electrolyte or non-electrolyte
  - (d) A lyophilic colloid
- 6. The catalyst used in the manufacture of methanol from water gas is [MP PET 2002]
  - (a)  $V_2O_5$
- (b) Ni + Mo
- (c)  $ZnO + Cr_2O_3$
- (d) Pt + W
- 7. Organic catalysts differ from inorganic catalysts

[AFMC 1989]

- (a) By acting at very high temperature
- (b) By acting at low temperature

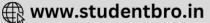
- (c) Being used up
- (d) Being proteinous in nature
- 8. Commercial detergents mainly contain[CPMT 1993]
  - (a) RCOONa
  - (b) RONa
  - (c) RSNa
  - (d) ROSO Na
- **9.** In which of the following processes shape-selective catalysis is occurring
  - (a) Conversion of alcohol to gasoline
  - (b) Synthesis of methanol from CO and  $H_2$
  - (c) Polymerisation of ethylene
  - (d) Synthesis of ammonia
- **10.** Which one of the following is used for reviving the exhausted permutite [EAMCET 2003]
  - (a) HCl solution
  - (b) 10% CaCl<sub>2</sub> solution
  - (c)  $10\% \ MgCl_2$  solution [AIIMS 1983, 84]
    - (d) 10% NaCl solution
- 11. The ability of a catalyst to accelerate the chemical reaction is known as [CPMT 2000; KCET 2000]
  - (a) Selectivelty
  - (b) Activity
  - (c) Negative catalyst
  - (d) None of these
- **12.**  $AlCl_3$ , in reactions, acts as
  - (a) Oxidizing agent
  - (b) Reducing agent
  - (c) Acid catalyst
  - (d) None of these
- 13. On addition of one ml of 10% NaCl solution to 10 ml gold sol in the presence of 0.25 gm of starch. The coagulation is just prevented, starch has gold number [MP PET 2004]
  - (a) 0.025
- (b) 0.25
- (c) 2.5
- (d) None
- **14.** Milk is an example of

[MP PET 2001; JIPMER 2002; MP PMT 2002,04]

(a) Pure solution







## 612 Surface Chemistry

(b) Gel

(d) Suspension

(c) Emulsion

## Answers and Solutions

(SET -14)

- 1. (c) In Haber's process we use iron as a catalyst, In Deacon's process we use  $Cu_2Cl_2$  as a catalyst and in lead chamber process we use  $N_2O_5$  as a catalyst but in solvay process no catalyst is used.
- **2.** (d) A catalyst can increase the rate or reaction and hence increases the frequency of collision of reacting species.
- 3. (b) 250 mg of X is present in 100 ml of colloidal sol of gold. By definition, gold no. of X is that amount of it in mg which is present in 10 ml of colloidal gold solution. Hence in 10 ml, the amount of X present is 25 mg which is the gold number of X.
- **4.** (c) Viscosity and surface tension are not same for water in hydrophillic sols.
- (a) Process of converting precipitate into colloidal particles by adding suitable electrolyte called peptisation and stabilizing agent (electrolytes) as peptizing agent.
- **6.** (c)  $[CO + H_2] + H_2 \xrightarrow{Z_{1O} + Cr_2O_3} CH_3OH$

- 7. (d) Organic catalyst are proteinous in nature and obtain from living cell.
- **8.** (a) Commercial detergents mainly contain salts of higher fatty acids.
- 9. (a,c) Shape selective catalyst are zeolites and zeolites are alminosilicates of general formula  $M_{x/n}[(AlO_2)_x.(SiO_2)_y].mH_2O$ . Zeolites are used in conversion of alcohol to gasoline and in polymerisation of ethylene.
- **10.** (d) 10% *NaCl* solution is used for reviving the exhaust permutite.
- 11. (b) The ability of a catalyst to accelerate the chemical reaction is known as its activity. Degree of acceleration can be as high as  $10^{10}$  times in certain reactions.
- 12. (c) AlCl<sub>3</sub> may be written as Al<sup>+3</sup>Cl<sup>-</sup> and all the tri-positive ions are Lewis acid hence it can be acts as acid catalyst.
- **13.** (d)  $0.25 \times 1000 = 250$

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**14.** (c) Milk is the example of emulsion of fat globules in water.