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G.R. No.	

[P118 - 124 (T2)]

OCTOBER 2018 / IN - SEM (T2)

F. Y. M. TECH. (WREE) (SEMESTER -I)

COURSE NAME: Advanced Water treatment

COURSE CODE: CVPA11184A

(PATTERN 2018)

Time: [30 Minutes] [Max. Marks: 10]

(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data where ever required**

Q.1) 10 marks (1 mark each)

1. The phenomenon of concentrations of molecules of a gas or liquid at a solid surface is called
a) Absorption c) Catalysis
b) Adsorption d) None of these

2. The adsorption of gases on metal surfaces is called
a) Catalysis c) adsorption
b) Occlusion d) absorption

3. The process of adsorption is
a) exothermic c) Sometimes exothermic or endothermic d) none of the above
b) endothermic

4. Physical adsorption is a _____ process.
a) reversible c) exothermic
b) irreversible d) none of these

5. Multi-molecular layers are formed in
a) absorption c) chemisorption
b) Physical adsorption d) Reversible adsorption

6. The relationship between equilibrium pressure of gas and its amount adsorbed on the solid adsorbent at constant temperature is called

a) Chemisorption
b) Adsorption isobar
c) Adsorption isotherm
d) None of these

7. Rusting of iron is

a) Oxidation
b) Reduction
c) Absorption
d) Adsorption

8. Chemisorption

a.Involves the weak attractive interactions between adsorbent and adsorbate
b.Is irreversible in nature
c. Decreases with increase of temperature
d .Involves multilayer formation of adsorbent on adsorbate

9. Tubular adsorber follows which isotherm

a) Langmuir b) freundlich c) Linear adsorption d) adsorber

10. The correlation to correlate adsorption data is (where Ymax is the maximum amount of solute adsorbed per mass of adsorbent, X is the mass fraction of solute in the diluent phase in solute-free basis, KL is a constant and Y is the equilibrium value of the mass of solute adsorbed per mass of adsorbent)

a) Y= YmaxX/ (KL+X)
b) Y = Ymax/ (KL+X)
c) Y = YmaxX/KL
d) Y= Ymax- X/ (KL+X)

OR

Q.2) 10 marks (1 mark each)

1. Hardness of water is due to the presence of salts of

a) Potassium
b) Chlorine
c) Magnesium
d) Boron

2. State whether the following statement is true or false.
The permanent hardness can be removed by adding lime and soda.

a) True b) False

3. Select the incorrect statement from the following option.

a) Water which does not form lather with soap and forms white scum is called hard water

b) Hard water contains dissolved calcium and magnesium salts in it

c) In hard water, cleansing quality of soap is depressed

4. Select the incorrect statement from the following option.

a) Permanent hardness is due to dissolved chlorides and sulphates of calcium and magnesium

b) It can be removed by mere boiling of water

c) It is also known as non-alkaline hardness

d) The difference between the total hardness and the alkaline hardness gives the non-alkaline hardness

5. The detention period of a lime soda treatment plant is

a) 1hour

b) 3hours

c) 2-4hours

d) 4-7hours

6. State true or false. Alkaline hardness is due to the presence of bicarbonate, carbonate and hydroxides of the hardness-producing metal ions.

a) True b) False

7. Hardness of water is conventionally expressed in terms of equivalent amount of

a) H_2CO_3

b) $MgCO_3$

c) $CaCO_3$

d) Na_2CO_3

8. The chemical equivalent of $MgSO_4$ salt is

a) 60

b) 47.5

c) 82

d) 68

9. In which process of water softening, ion exchange phenomenon takes place?

a) Lime soda process

b) Zeolite process

c) Boiling

d) Demineralization process

10. The thickness of the layers of filter sand of zeolite softener is

a) 20cm

b) 30cm

c) 40cm

d) 100cm