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Question Paper Code: 58971

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

One credit course

Chemical Engineering

15UCH871 - MEMBRANE TECHNOLOGY

(Regulation 2015)

Duration: 1.30 hours

Maximum: 50 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Polymers which cannot be processed by solution casting are CO1- R
(a) Polyethylene and nylon (b) Polystyrene
(c) Both (a) and (b) (d) None of the above
2. Microporous membranes has pore size of CO1- R
(a) 1-10 μ m dia (b) 0.01-10 μ m dia (c) 100-1000 μ m dia (d) 50-100 μ m dia
3. _____ membranes are being considered for the separation of CO1- R
hydrogen from gas mixtures.
(a) zirconium (b) palladium (c) nickel (d) both (a) and (c)
4. Casting solution solvents are CO1-R
(a) Benzene (b) Acetone (c) Dimethyl formamide (d) Ethyl formate
5. The mechanism of transport through the non-porous dense membrane is by CO1-R
(a) Solution diffusion model (b) Pore flow model
(c) Both (a) and (b) (d) Temperature difference
6. Microfiltration membranes filter _____ from 0.1 to 10 μ m. CO2-R
(a) salts (b) influenza virus
(c) sucrose (d) colloidal particles and bacteria

7. The driving force of pervaporation process is CO2-R
- (a) High vapor pressure on the permeate side
 (b) Low vapor pressure on the permeate side
 (c) Concentration gradient on the permeate side
 (d) All of the above
8. A 40 inch long spiral wound modules with a module diameter of 4 will CO2- R
 have an area of _____ m²
- (a) 6 -12 (b) 3-6 (c) 20-40 (d) 80-150
9. Microfiltration membranes filter _____ from 0.1 to 10 μm CO2-R
- (a) Salts (b) Influenza virus
 (c) Sucrose (d) Colloidal particles and bacteria
10. Increasing the polymer casting solution concentration always CO2-R
- (a) Increases porosity and flux of membrane
 (b) Reduces porosity and flux of membrane
 (c) Increases porosity and decreases flux of membrane
 (d) Reduces porosity and increases flux of membranes

PART – B (5 x 2= 10 Marks)

11. List some of the key properties determining membrane performance. CO1- R
12. Write down the three different mechanisms by which separations occur. CO1 -R
13. How membranes are used in control drug delivery? CO1- R
14. What is the difference between osmosis and reverse osmosis? CO2 -R
15. How isotropic nonporous membranes are synthesized by solution casting? CO2 -R

PART – C (2 x 15= 30 Marks)

16. (a) Discuss about various methods by which porous membranes are synthesized? CO1 -U (15)
- Or
- (b) Explain the methods which are used to synthesize dense film membranes. CO1-U (15)
17. (a) Demonstrate various methods by which anisotropic membranes are synthesised. CO2 -U (15)

Or

- (b) Discuss in detail the design considerations involved in fabricating CO₂-U (15)
spiral wound membranes and hollow fiber membranes.