B. Tech.

(SEM. VI) EXAMINATION, 2007

SURFACTANTS & SYNTHETIC DETERGENTS

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions. All questions carry equal marks.

1 Attempt any four of the following : 5x4=20

(a) How are surfactants classified? Give at least two examples of each class with their chemical structure.

(b) Give the route of synthesis and applications of ester and amide type of surfactants.

(c) Define cationic surfactants and give its examples. Also give the route of synthesis of any one cationic surfactant.

(d) Explain the hydrophilic behavior of polyethylene glycol type of nonionic surfactants.

(e) What do you understand by critical micelle concentration? Discuss its significance with respect to detergency.

(f) Describe the route of synthesis of Alpha – Olefin Sulfonate. Also give its industrial applications.
2 Attempt any two of the following: 10×2=20
(a) Discuss the significance of wetting power and foaming power of a surfactant. Also describe a suitable method for measurement of wetting power of a surfactant.
(b) Discuss the significance of dispersing power and emulsifying power of a surfactant and give a suitable method for the measurement of dispersing power.
(c) Explain the following:
   (i) Measurement of Critical Micelle Concentration
   (ii) Foaming of liquids.

3 Attempt any two of the following: 10×2=20
(a) With help of a neat flow diagram explain the working of Mazzoni thin film sulfonator.
(b) What are the different methods of sulphur trioxide gas production? Explain any one method with help of a neat flow diagram.
(c) Define cationic surfactants. Also explain the production of quaternary ammonium compounds with help of a neat flow diagram.

4 Attempt any two of the following: 10×2=20
(a) What do you understand by the term Builder? Give a detailed classification of builders along with their examples and their role in detergent formulation.
(b) With help of a neat flow diagram explain the process for manufacturing of liquid detergent.

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(c) What are the essential characteristics of a good spray-dried detergent powder? Also discuss the essential components of a complete spray drying plant for production of detergent powder.

5 Attempt any two of the following: 10 \times 2 = 20

(a) Describe the BIS method used for the determination of total phosphates of detergent powder.

(b) What do you understand by the term Biodegradability? Also explain the effect of various active matter and builders used in detergent powders on environment.

(c) Write short notes on the following:
   (i) Sequestration
   (ii) Enzymes
   (iii) Soil suspending agents
   (iv) Alkanolamides.