MIT School of Engineering
Engineering Chemistry

Unit I Water Technology for Industry and Green Chemical Processes

Q 1 Define following terms

(a) Hard Water (b) Soft water (c) Temporary Hardness (c) Permanent Hardness (d) Alkalinity (e) Scale (f) Sludge

Q 2 Explain EDTA method for the determination of hardness.

(Ans: Theory, Principle, Reactions, Procedure and Formula for calculations)

Q 3 Differentiate between

(a) Scales and Sludges (b) Zeolite and Ion Exchange methods

Q 4 Describe in brief determination of alkalinity of given water sample.

(Ans: Principle, Procedure, Reactions, and Formula for calculations)

Q 5 (a) What are the causes, preventions, disadvantages of scale and sludge formation in the boilers?

Q 6 (a) Write principle, construction with neat diagram, working, reactions and advantages, disadvantages for the demineralization of water by using Ion Exchange resin.

(b) Write principle, construction with neat diagram, working, reactions, advantages, and disadvantages for the Softening of hard water by Zeolite Method.

Q 7 Explain any SIX principles of green chemistry with example.

Q 8 State the problems/disadvantages in traditional synthesis route and benefits/advantages of green route in manufacture of the following

a) Adipic acid (b) Indigo dye (c) Polycarbonate

(Ans: Reactions of both traditional and green route, disadvantages, advantages of respective routes)

Numerical problems based on Hardness (EDTA method) (05) and Alkalinity (05)