

UNIT OPERATIONS AND PROCESSES IN WATER AND WASTEWATER TREATMENT

Factors in selection of unit operations and processes - Principal type of Reactors - Flow measurement - Screening - Flow Equalization - Mixing - Static and Mechanical mixers - Coagulation and Flocculation - Perikinetic and Orthokinetic flocculation.

Sedimentation - Type of settling - Removal ratio - Tray and Titled plate settlers - Flotation - Dissolved air flotation. Filtration - Type of filters - Head loss through filters - Carmen-Kozeny equation - Gas Transfer - Two film Theory - Mass transfer coefficient - Oxygenation capacity.

Adsorption - Activated carbon - Isotherms - Disinfection - Factors Influencing - Breakpoint chlorination - Dechlorination.

Kinetic of Biological growth - Suspended and attached growth processes - Aerobic and Anaerobic - Determination of kinetic coefficients

Nitrification, denitrification, nitrification-denitrification, Nitrogen removal by physical-chemical process
Chemical precipitation - phosphate removal - removal of refractory organics, removal of dissolved inorganic substances, removal of dissolved, inorganic substances,. Ultimate disposal of contaminants.

TEXT BOOKS

1. Metcalf & Eddy, INC. "Wastewater Engineering - Treatment, Disposal, and Reuse ", Third Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi 1995.
2. Lee, CC and Shun dar Lin, Handbook of Environmental Engineering Calculations, McGraw-Hill, New York, 1999.