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Nota di contenuto	Cover; Title Page; Copyright; Contents; Preface to the second edition; Chapter 1 Introduction; 1.1 Characteristics of agricultural and food wastewater; 1.1.1 General characteristics of wastewaters in agriculture and food processing; 1.1.2 Parameters for physicochemical treatment of wastewater; 1.1.3 Parameters for biological treatment of wastewater; 1.1.4 Nitrogen and phosphorous; 1.1.5 Sampling; 1.2 Material balances and stoichiometry; 1.3 Fluid flow rate and mass loading; 1.4 Kinetics and reaction rates; 1.4.1 Zero-order reactions; 1.4.2 First-order reactions; 1.4.3 Second-order reactions 1.4.4 Mixed-order or higher-order reactions 1.4.5 Catalytic reactions; 1.5 Theoretical modeling and design of biological reactors; 1.5.1 Batch reactors; 1.5.2 Continuous stirred tank reactors (CSTRs); 1.6 Process economics; 1.6.1 Capital costs; 1.6.2 Operational costs and facility maintenance; 1.7 Further reading; 1.8 References; Chapter 2 Basic microbiology in wastewater treatment; 2.1 Introduction; 2.2 Structures of cells; 2.3 Important microorganisms in wastewater; 2.3.1 Bacteria and fungi; 2.3.2 Algae; 2.3.3 Protozoa and metazoa 2.3.4 Role of microorganisms in biological wastewater treatment 2.4 Microbial metabolism; 2.4.1 Microbial energy generation; 2.4.2 Uptake

of substrates into microbial cell; 2.4.3 Oxidation of organic and inorganic substrates; 2.5 Nitrification; 2.6 Denitrification; 2.7 Further reading; 2.8 References; Chapter 3 Physicochemical wastewater treatment processes; 3.1 Introduction; 3.2 Equalization basins; 3.3 Screening; 3.4 Flotation; 3.5 Sedimentation; 3.5.1 Discrete settling (Type I); 3.5.2 Flocculent settling (Type II); 3.5.3 Zone settling (Type III); 3.5.4 Compression zone (Type IV) 3.6 Coagulation and flocculation 3.7 Filtration processes; 3.8 Adsorption; 3.9 Chemical oxidation; 3.10 Membrane separations; 3.10.1 Membrane separation by hydrostatic pressure difference; 3.10.2 Membrane separations by electrical potential difference: electrodialysis (ED); 3.10.3 Membrane separations by partial vapor pressure gradient; 3.10.4 Membrane contactor (MC); 3.10.5 Design considerations; 3.10.6 Membrane modules; 3.10.7 Whose fault? membrane fouling; 3.11 Ion exchange; 3.11.1 Strong acid cation resins; 3.11.2 Weak acid cation resins; 3.11.3 Strong base anion resins 3.11.4 Weak base anion resins 3.11.5 Evaluation of resins; 3.11.6 Ion exchange systems; 3.12 Closing remarks; 3.13 Further reading; 3.14 References; Chapter 4 Biological wastewater treatment processes; 4.1 Introduction; 4.2 Kinetics of biochemical systems in wastewater microbiology; 4.2.1 Effects of temperature on reaction rates; 4.2.2 Effects of pH and dissolved oxygen concentration on reaction rates; 4.2.3 Kinetic equations of bacterial growth; 4.3 Idealized biochemical reactors; 4.3.1 The ideal batch reactor; 4.3.2 Ideal plug-flow reactor 4.3.3 Ideal continuous-flow stirred-tank reactor (CSTR)

Sommario/riassunto

Wastes, whether they are solid wastes or wastewater, are resources from which economic values may be derived. Almost all components of agricultural and food wastewater can be and should be utilized or recovered; the stumbling block of achieving this aspiration is economical, not technical. The last one and a half decades have seen the surging of agricultural and non-agricultural commodity prices across the board and increased public consciousness of environmental impact of industrial wastewater discharge and treatment. The confluence of these new developments have generated new interests an

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