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Nota di contenuto	Biological Sludge Minimization and Biomaterials/Bioenergy Recovery Technologies; Contents; Preface; Contributors; 1 Fundamentals of Biological Processes for Wastewater Treatment; 1.1 Introduction; 1.2 Overview of Biological Wastewater Treatment; 1.2.1 The Objective of Biological Wastewater Treatment; 1.2.2 Roles of Microorganisms in Wastewater Treatment; 1.2.3 Types of Biological Wastewater Treatment Processes; 1.3 Classification of Microorganisms; 1.3.1 By the Sources of Carbon and Energy; 1.3.2 By Temperature Range; 1.3.3 Microorganism Types in Biological Wastewater Treatment 1.4 Some Important Microorganisms in Wastewater Treatment 1.4.1 Bacteria; 1.4.2 Fungi; 1.4.3 Algae; 1.4.4 Protozoans; 1.4.5 Rotifers and Crustaceans; 1.4.6 Viruses; 1.5 Measurement of Microbial Biomass; 1.5.1 Total Number of Microbial Cells; 1.5.2 Measurement of Viable Microbes on Solid Growth Media; 1.5.3 Measurement of Active Cells in Environmental Samples; 1.5.4 Determination of Cellular Biochemical

Compounds; 1.5.5 Evaluation of Microbial Biodiversity by Molecular Techniques; 1.6 Microbial Nutrition; 1.6.1 Microbial Chemical Composition; 1.6.2 Macronutrients; 1.6.3 Micronutrients 1.6.4 Growth Factor 1.6.5 Microbial Empirical Formula; 1.7 Microbial Metabolism; 1.7.1 Catabolic Metabolic Pathways; 1.7.2 Anabolic Metabolic Pathway; 1.7.3 Biomass Synthesis Yields; 1.7.4 Coupling Energy-Synthesis Metabolism; 1.8 Functions of Biological Wastewater Treatment; 1.8.1 Aerobic Biological Oxidation; 1.8.2 Biological Nutrients Removal; 1.8.3 Anaerobic Biological Oxidation; 1.8.4 Biological Removal of Toxic Organic Compounds and Heavy Metals; 1.8.5 Removal of Pathogens and Parasites; 1.9 Activated Sludge Process; 1.9.1 Basic Process; 1.9.2 Microbiology of Activated Sludge 1.9.3 Biochemistry of Activated Sludge 1.9.4 Main Problems in the Activated Sludge Process; 1.10 Suspended- and Attached-Growth Processes; 1.10.1 Suspended-Growth Processes; 1.10.2 Attached-Growth Processes; 1.10.3 Hybrid Systems; 1.10.4 Comparison Between Suspended- and Attached-Growth Systems; 1.11 Sludge Production, Treatment and Disposal; 1.11.1 Sludge Production; 1.11.2 Sludge Treatment Processes; 1.11.3 Sludge Disposal and Application; References; 2 Sludge Production: Quantification and Prediction for Urban Treatment Plants and Assessment of Strategies for Sludge Reduction
2.1 Introduction 2.2 Sludge Fractionation and Origin; 2.2.1 Sludge Composition; 2.2.2 Wastewater Characteristics; 2.3 Quantification of Excess Sludge Production; 2.3.1 Primary Treatment; 2.3.2 Activated Sludge Process; 2.3.3 Phosphorus Removal (Biological and Physicochemical); 2.4 Practical Evaluation of Sludge Production; 2.4.1 Sludge Production Yield Variability with Domestic Wastewater; 2.4.2 Influence of Sludge Age: Experimental Data Versus Models; 2.4.3 ISS Entrapment in the Sludge; 2.4.4 Example of Sludge Production for a Different Case Study; 2.5 Strategies for Excess Sludge Reduction
2.5.1 Classification of Strategies

Sommario/riassunto

A comprehensive guide to sludge management, reuse, and disposal
When wastewater is treated, reducing organic material to carbon dioxide, water, and bacterial cells-the cells are disposed of, producing a semisolid and nutrient-rich byproduct called sludge. The expansion in global population and industrial activity has turned the production of excess sludge into an international environmental challenge, with the ultimate disposal of excess sludge now one of the most expensive problems faced by wastewater facilities. Written by two leading environmental engineers, Biological
