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Nota di contenuto	Activated Carbon for Water and Wastewater Treatment: Integration of Adsorption and Biological Treatment; Preface; List of Abbreviations; Acknowledgement; 1: Water and Wastewater Treatment: Historical Perspective of Activated Carbon Adsorption and its Integration with Biological Processes; 1.1 Historical Appraisal of Activated Carbon; 1.2 General Use of Activated Carbon; 1.3 Application of Activated Carbon in Environmental Pollution; 1.3.1 Activated Carbon in Drinking Water Treatment; 1.3.2 Activated Carbon in Wastewater Treatment; 1.3.2.1 Municipal Wastewater Treatment 1.3.2.2 Industrial Wastewater Treatment 1.3.3 Applications of Activated Carbon in Other Environmental Media; 1.3.3.1 Remediation of Contaminated Groundwater and Soil; 1.3.3.2 Treatment of Flue Gases; 1.3.3.3 Water Preparation for Industrial Purposes; 1.3.4 Integration of Activated Carbon Adsorption with Biological Processes in Wastewater and Water Treatment; 1.3.4.1 Wastewater Treatment; 1.3.4.2 Water Treatment; 1.3.5 Improved Control of Pollutants through Integrated Adsorption and Biological Treatment; 2: Fundamentals of Adsorption

onto Activated Carbon in Water and Wastewater Treatment

- 2.1 Activated Carbon
 - 2.1.1 Preparation of Activated Carbons; 2.1.2 Characteristics of Activated Carbon; 2.1.3 Activated Carbon Types; 2.1.3.1 Powdered Activated Carbon (PAC); 2.1.3.2 Granular Activated Carbon (GAC); 2.2 Adsorption; 2.2.1 Types of Adsorption; 2.2.2 Factors Influencing Adsorption; 2.2.2.1 Surface Area of Adsorbent; 2.2.2.2 Physical and Chemical Characteristics of the Adsorbate; 2.2.2.3 pH; 2.2.2.4 Temperature; 2.2.2.5 Porosity of the Adsorbent; 2.2.2.6 Chemical Surface Characteristics; 2.2.3 Kinetics of Adsorption; 2.2.3.1 Transport Mechanisms
 - 2.2.4 Adsorption Equilibrium and Isotherms
 - 2.2.5 Single- and Multisolute Adsorption; 2.2.5.1 Single Solute Adsorption; 2.2.5.2 Multisolute Adsorption; 2.3 Activated Carbon Reactors in Water and Wastewater Treatment; 2.3.1 PAC Adsorbers; 2.3.2 GAC Adsorbers; 2.3.2.1 Purpose of Use; 2.3.2.2 Types of GAC Adsorbers; 2.3.2.3 Operation of GAC Adsorbers; 2.3.2.4 Breakthrough Curves; 2.4 Activated Carbon Regeneration and Reactivation; 3: Integration of Activated Carbon Adsorption and Biological Processes in Wastewater Treatment
- 3.1 Secondary and Tertiary Treatment: Progression from Separate Biological Removal and Adsorption to Integrated Systems
 - 3.1.1 Activated Carbon in Secondary Treatment; 3.1.1.1 PAC; 3.1.1.2 GAC;
 - 3.1.2 Activated Carbon in Tertiary Treatment; 3.1.2.1 PAC; 3.1.2.2 GAC; 3.2 Fundamental Mechanisms in Integrated Adsorption and Biological Removal; 3.2.1 Main Removal Mechanisms for Organic Substrates; 3.2.1.1 Biodegradation/Biotransformation; 3.2.1.2 Sorption onto Sludge; 3.2.1.3 Sorption onto Activated Carbon; 3.2.1.4 Abiotic Degradation/Removal
 - 3.2.2 Main Interactions between Organic Substrates, Biomass, and Activated Carbon

Sommario/riassunto

This monograph provides comprehensive coverage of technologies which integrate adsorption and biological processes in water and wastewater treatment. The authors provide both an introduction to the topic as well as a detailed discussion of theoretical and practical considerations. After a review of the basics involved in the chemistry, biology and technology of integrated adsorption and biological removal, they discuss the setup of pilot- and full-scale treatment facilities, covering powdered as well as granular activated carbon. They elucidate the factors that influence the successful
