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	Zeolite Membrane Reactors; 5.2 Fluidised Bed Membrane Reactor; 5.3 Perovskite Membrane Reactors; 5.4 Hollow Fibre Membrane Reactors; 5.5 Catalytic Membrane Bioreactor; 6.1 A Brief History of the MBR Technology Development 6.2 Market Value and Drivers6.3 Commercially Available MF/UF Membranes for MBR; 6.3.1 Membrane Geometry; 6.3.2 Mode of Operation: Inside-Out Versus Outside-In Flow; 6.3.3 Membrane Materials and Material Properties; 6.3.4 Features of Commercial MBR Technologies; 6.4 Advantages of MBR over CAS; 6.5 Organics and Nutrients Removal in MBR; 6.5.1 Removal of Organic Matter and Suspended Solids; 6.5.2 Nutrient Removal; 6.6 Recalcitrant Industrial Wastewater Treatment by MBR; 6.6.1 Micropollutants; 6.6.2 Dye Wastewater; 6.6.3 Tannery Wastewater; 6.6.4 Landfill Leachate 6.6.5 Oil Contaminated Wastewater 6.6.6 Insight into Recalcitrant Compound Removal in MBR; 6.7 Recent Advances in Membrane Bioreactors Design/Operation; 6.8 Development Challenges; 6.8.1 Membrane Fouling; 6.8.2 Pre-Treatment Requirement; 6.8.3 Maintaining Membrane Integrity; 6.9 Future Research; 7 Conclusion; References; 1 Microporous Carbon Membranes; 1.3 Methods for the Preparation of Microporous Carbon Membranes; 1.3.1 General Preparation and Characterisation; 1.3.2 Classification of Carbon Membranes 1.3.3 The Pyrolysis Process1.3.4 Pretreatment; 1.3.5 Post-Treatment; 1.3.6 Polymer Precursors; 1.3.7 Adjustments of Pore Structures; 1.3.8 Modification of Porous Substrates; 1.3.9 Current Status; 1.3.10 Mixed- Matrix Carbon Membranes; 1.4 Membrane Modules; 1.5 Applications of Membranes in Membrane Reactor Processes; 1.6 Final Remarks and Conclusions; References; 2 Metallic Membranes by Wire Arc Spraying; Preparation, Characterisation and Applications; 2.1 Introduction; 2.2 Thermal Spraying; 2.2.1 Definition and Types; 2.2.2 Applications; 2.2.3 Wire Arc Spraying; 2.3.1 Preparation of Membranes
Sommario/riassunto	A membrane reactor is a device for simultaneously performing a reaction and a membrane-based separation in the same physical device. Therefore, the membrane not only plays the role of a separator, but also takes place in the reaction itself. This text covers, in detail, the preparation and characterisation of all types of membranes used in membranes reactors. Each membrane synthesis process used by membranologists is explained by well known scientists in their specific research field. The book opens with an exhaustive review and introduction to membrane reactors, introducing the recent adv