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Nota di contenuto	Biogas Production: Pretreatment Methods in Anaerobic Digestion; Contents; Preface; Acknowledgements; Special Contributor; Editor; List of Contributors; 1. Anaerobic Digestion: Pretreatments of Substrates; 1.1 Pretreatments in Anaerobic Digestion Process; 1.1.1 Anaerobic Digestion Pretreatments of Substrates; 1.2 Physical Pretreatment; 1.2.1 Mechanical Pretreatment; 1.2.2 Thermal Pretreatment; 1.2.3 Ultrasound-assisted Pretreatment; 1.3 Chemical Pretreatment; 1.4 Biological Pretreatment; 1.5 Combined Pretreatment; 1.6 Concluding Note; Acknowledgements; References 2. Recalcitrance of Lignocellulosic Biomass to Anaerobic Digestion2.1 Introduction; 2.2 Plant Cell Wall Anatomy; 2.3 Chemistry of Cell Wall Polymers; 2.3.1 Chemistry of Cell Wall Polysaccharides; 2.3.1.1 Cellulose; 2.3.1.2 (1->3,1->4)--D-Glucans; 2.3.1.3 Heteroglucans (Xyloglucans); 2.3.1.4 Heteroxylans; 2.3.1.5 Heteromannans; 2.3.1.6 Pectic Polysaccharides (Pectins); 2.3.2 Cell Wall Proteins; 2.3.3 Lignin in

Plant Cell Walls; 2.4 Molecular Interactions Between Cell Wall Polymers; 2.5 Plant Cell Wall Molecular Architecture; 2.6 Recalcitrance of Plant Cell Wall Cellulose 2.7 Reduction of Biomass Recalcitrance 2.7.1 Physical and Chemical Pretreatments; 2.7.2 Bacterial Hydrolysis; 2.8 Concluding Note; References; 3. The Effect of Physical, Chemical, and Biological Pretreatments of Biomass on its Anaerobic Digestibility and Biogas Production; 3.1 Introduction; 3.2 Pretreatment Methods for Lignocellulosic Biomass; 3.2.1 Lignocellulosic Biomass; 3.2.1.1 Structure of Lignocellulosic Biomass; 3.2.1.2 Lignocellulosic Feedstocks; 3.2.2 Pretreatment of Lignocellulosic Biomass; 3.3 Pretreatment Methods for Sewage Sludge; 3.3.1 Sludge Pretreatment; 3.4 Concluding Note References 4. Application of Ultrasound Pretreatment for Sludge Digestion; 4.1 Introduction; 4.2 Anaerobic Digestion; 4.3 Overview of Pretreatment Methods for Anaerobic Digestion; 4.3.1 Thermal Pretreatment; 4.3.2 Mechanical Pretreatment; 4.3.3 Chemical Pretreatment; 4.3.4 Enzyme Pretreatment; 4.3.5 Irradiation Pretreatment; 4.3.6 Ultrasound Pretreatment; 4.4 Fundamental of Ultrasound; 4.4.1 Introduction; 4.4.2 Basic Theory of Cavitation and Acoustic Cavitation; 4.4.3 Acoustic Cavitation Conditions; 4.5 Bubbles Dynamic; 4.5.1 Formation of Bubbles; 4.5.2 Behaviour of Acoustic Cavitation Bubbles 4.5.3 Sonoluminescence v/s Sonochemiluminescence 4.6 Effects of Ultrasound; 4.6.1 Chemical Effects; 4.6.2 Physical and Mechanical Effects; 4.6.3 Biological Effects; 4.7 Ultrasound Applications; 4.7.1 Ultrasound in Medicine and Therapy; 4.7.2 Ultrasound in Science and Technology; 4.7.3 Ultrasound in Environmental Applications; 4.7.3.1 Air Cleaning; 4.7.3.2 Land Remediation; 4.7.3.3 Water Remediation; 4.7.3.4 Wastewater Treatment; 4.8 Ultrasonication for Anaerobic Digestion; 4.8.1 Mechanisms of Ultrasound Pretreatment; 4.8.2 Influencing Factors; 4.8.2.1 Sonication Parameters 4.8.2.2 Sludge Characteristics

Sommario/riassunto

"This book highlights the recent advances in the pretreatment and value addition of lignocellulosic wastes and other biomass forms"--