

# Biomethanization of the Organic Fraction of Municipal Solid Wastes

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*Biomethanization of the Organic Fraction of Municipal Solid Wastes* is a comprehensive introduction to both the fundamentals and the more practical aspects of the anaerobic digestion of organic solid wastes, particularly those derived from households, that is, the organic fraction of municipal solid wastes. It can be used as a textbook for specialized courses and as a guide for practitioners.

In the first part, the book covers the relevant aspects of anaerobic digestion (AD) of organic wastes. The fundamentals and kinetic aspects of AD are reviewed with particular emphasis on the aspects related to solid wastes. This introduction is necessary to have a comprehensive view of the AD process and to understand the practical principles. Through this introduction, it is intended to facilitate the technology transfer from laboratory or pilot plant experiences to full-scale process, in order to implement improvements in current digesters.

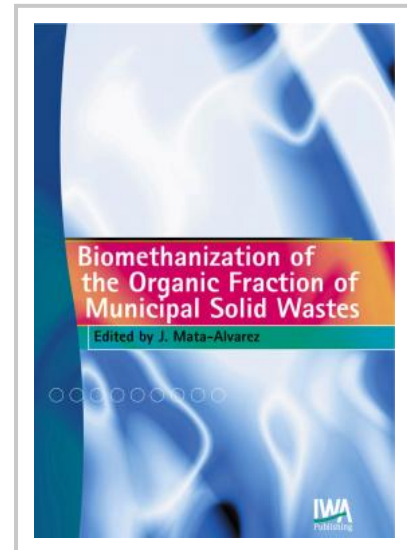
Laboratory methods are described for the analysis and optimization of reactor performance, such as methanogenic activity tests or experimental evaluation of the biodegradation kinetics of solid organic waste. The different reaction patterns applied to industrial reactors are outlined. Industrial reactors are classified in accordance with the system they use, pointing out advantages and limitations.

Co-digestion, enabling the co-treatment of organic wastes of different origin in a more economically feasible way, is described in detail. Examples of co-digestion are given, with OFMSW as a base-substrate. Finally, full-scale co-digestion plants are discussed. Various types of pre-treatment to increase the biodegradability, and thus the yields of the process, are reviewed in detail.

The use of the fermentation products of anaerobic digesters for biological nutrient removal processes in wastewater treatment plants is described. This constitutes an example of integrated waste management, a field in which both economic and technical advances can be achieved. Balances are given to justify the approach, and a full-scale case study is presented.

The important topic of economics and the ecological advantages of the process are emphasized. The use of compost, the integration with composting technology, and advantages over other technologies are detailed in the framework of an environmental impact assessment of biowaste treatment.

Finally, the anaerobic digestion of MSW in landfills is reviewed in detail, with emphasis on landfill process enhancement and strategies for its application.



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