

Study of lignocelulosic biomass pretreatment

Ilirjan MALOLLARI¹, P. HOXHA², Anisa DHROSO¹, F. GJYRIQI¹, Petrit KOTORI³, Joana LENA¹

¹University of Tirana, Faculty of Natural Sciences, Department of Industrial Chemistry, Bulevard Zogu I 1, 1001 Tirana, Albania, (e-mail: ilir.malo@gmail.com)

²Polytechnic University of Tirana, Faculty of Geosciences

³University of Vlora, Faculty of Natural Sciences, Department of Chemistry, Lagja Skele 1, 9401 Vlora, Albania

Abstract

Pretreatment of lignocelluloses biomass is usually intended for preparing disposable organic material for the enzymatic reactions, dividing hemicelluloses from the structure and destroying crystalline structure of the cellulose.

During this process the change of the composition ratio within lignin : hemicelluloses : cellulose, which influence on the particle size, degree of polymerization, pore volume, solubility rate etc. is expected to happen. Although there are different types of pretreatment such as mechanical, thermal, acidic, alkaline, (said chemical), as well as biological method.

Our study has been focused in preparing biomass for the anaerobic digestion for methane profit, using calculated mixtures of different agro-forestry residues such as wheat straw, mais straw etc., premixing them with animal wastes like manures and other organic wastes. Experimental series have been performed with wide ratios of C:N and the results were positive promising the great future.

Then we have followed a systematic procedure for the anaerobic biologic digestion process design simulated in a fixed capacity chosen. As a result we have recommended an engineering flow sheet for the specified biochemical process.

Key words: biomass pretreatment, methane process design, lignocelluloses material, anaerobic digestion

sa2015_a0124