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WASTEWATER CLEANING AND PRODUCING ENERGY SOURCES THERMOPHILIC ANAEROBIC ASSOCIATION

Pulp and paper industry is one of major source of aquatic environment contamination. Waste water of such enterprises contains cellulose fibers that has serious issues with utilization of them. However, wastes of cellulose are perspective sources for energy obtaining by anaerobic fermentation to get gaseous products, organic acids, alcohols etc.

Therefore, the aim of research was isolation anaerobic microbial association with studing its capabilities for wastewater treatment of pulp and paper industry and producing energy resources during biotransformation of cellulosic waste.

As perspective for manufacture was obtain thermophilic (60°C) anaerobic microbe association, consisting of cellulolytic and methanogenic bacteria from waste water of Kyiv cardboard-paper enterprise. The association completely destroys the cellulose during 4-5 days and synthesizes the hydrogen at the first stages and methane in final (Fig. 1). Beside that ethanol, acetate, propionate, butyrate are obtained. When using anaerobic association in wastewater treatment cardboard - paper enterprise, chemical oxygen demand decreases by three times (Fig. 2).

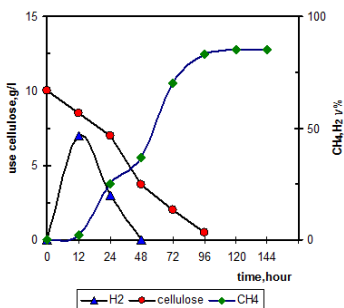


Fig. 1. The formation of hydrogen and methane in the transformation of cellulose anaerobic association

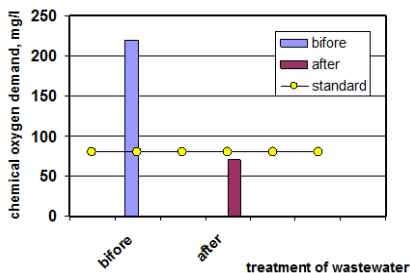


Fig. 2. Decreasing of chemical oxygen demand in wastewater treatment by anaerobic association

Thus, promising anaerobic association, consisting of cellulolytic and methanogenic bacteria has been isolated, which is actively treat the wastewater of pulp-paper enterprises and producing biogas and liquid sources of energy.