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POSSIBILITY OF IMPROVING TECHNOLOGICAL EFFECTIVENESS OF DAIRY WASTEWATER TREATMENT THROUGH APPLICATION OF ACTIVE FILLINGS AND MICROWAVE RADIATION

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The aim of the study was to determine the technological effectiveness of treatment process of model dairy wastewater in anaerobic reactors with active filling (AF), heated with electromagnetic microwave radiation (EMR). Experiments were conducted in a laboratory scale. The AF were produced using micro-pore extrusion technology. The study demonstrated that AF introduction to the technological system and application of EMR significantly improved the effectiveness of organic compounds, phosphorus removal and biogas production. Initial organic loading rate also affected the final results of wastewater treatment.

Keywords: microwave radiation, active filling, fermentation, dairy wastewaters, wastewaters treatment.

Introduction

Popularity of anaerobic digestion in wastewater treatment processes stems from technological benefits gained, low exploitation costs and possibility of energy recovery [1 – 3]. The main drawback of solutions based on the anaerobic process is the low effectiveness of nitrogen and phosphorus removal involving only the coverage of the demand for these elements by fermentation bacteria [4]. This phenomenon necessitates the use of additional technological processes including chemical precipitation of phosphorus or the use of aerobic treatment. Although effective, these methods generate additional exploitation costs and require assuring specific technological parameters [5, 6]. An alternative to currently applied solutions is the use of fillings that aid the processes of sorption, precipitation and binding of biogenic compounds [7, 8]. Effective removal of phosphorus under anaerobic conditions has been proved feasible

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