

MODELLING AND SIMULATION OF A WASTE TO ENERGY SYSTEM WITH IPSEPRO™ SOFTWARE: BIOGAS GENERATION

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ABSTRACT

The main objective of this work is to evaluate the steady-state modeling solution for a single stage thermophilic biogas reactor using animal manure as substrate. Thus software package IPSEpro™ from SimTech Simulation Technology, Austria was used. IPSEpro is a highly flexible environment for modeling, simulation, analysis and design of components and processes for energy and chemical engineering. Besides the standart power plant library which includes basic components for power plant simulation like gas turbine, compressor, heat exchanger etc.; a biogas reactor component was built via Model Development Kit (MDK). Biogas reactor includes mechanical mixer with an heat exchanger inside of the reactor. The results of the study include; software efficiency on modeling of a complex biochemical reaction, the amount of generated biogas, reactor energy use per dry matter of substrate added.