



DEVELOPMENT OF A GAS PERMEATION MODEL FOR BIOGAS UPGRADING

Marilena Net*, Michael Harasek, Anton Friedl

Vienna University of Technology, Getreidemarkt 9/166, A-1060 Vienna, Austria

Abstract

There is a growing concern about the impact that increased emissions of certain gases, known as "greenhouse gases", are having on the global climate. Because of this, the Kyoto Protocol has been established to limit emissions of these gases. The use of biomass feedstock is one of the most obvious forms of renewable energy. Biomass can be used in a wide range and the biological conversion to biogas has become one of the key energy resources for global sustainable development.

In this paper a model for gas permeation was developed, as application for biogas upgrading. The gas permeation model was developed by using the software tool AspenPlus 11.1 with Microsoft Office Excel 2003. The mathematical model is based on the solution-diffusion mechanism for species permeation through the membrane and the model has been created for binary gas mixtures. By testing the model, the validity range of the model was established. The model was designed for implementation in Aspen Library using a defined AspenPlus unit operation model.

Keywords: biogas, gas permeation, modelling, process simulation, solution-diffusion mechanism.

* Author to whom all correspondence should be addressed: Phone: +43-650-8530531, e-mail: mnet@mail.zserv.tuwien.ac.at