

IDENTIFICATION OF BIOGEOCHEMICAL DEGRADATION PARAMETERS OF PROPYLENE GLYCOL BY COMPLEX MODELLING

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The application of complex reactive multicomponent transport models requires the determination of numerous parameters which is still a demanding task. In particular biodegradation parameters are often not known, not appropriate for the situation at hand (e.g. models of first order), and / or vary over large ranges of values in the literature. However the interplay of modelling and experimental study allows to identify and also to quantify even complex reaction processes.

It is demonstrated with the help of a case study concerning the anaerobic degradation of propylene glycol how complex column experiments in connection with advanced, versatile simulation tools allow the identification of several biodegradation parameters including the yield factor or Monod half saturation concentrations. It is also shown that simple experimental settings with, e.g., continuous feed and stationary flow regime, do not allow the complex parameter identification, but that the ill-posedness can be overcome by advanced experiment design including flow interruptions, variations of inflow concentrations and flow rates.