

Predicting Ash Behavior in Biomass Co-combustion – A Balance Between Chemistry and Mass Transport

Rainer Backman

Energy Technology and Thermal Process Chemistry
Umeå University

Abstract

In furnace models for biomass combustion, chemical equilibrium analysis is a useful tool to describe phenomena such as bed agglomeration, deposition, corrosion and volatilisation. Global equilibrium analysis has recently been used in many applications and provides usually a good overview of ash stabilities and possible reactions. In many cases, however, mass transport and mixing phenomena are limiting. Thus, local chemical models must be developed in order to optimally utilize results of equilibrium calculations. Particularly when several solid fuel qualities are mixed, problems arise with different ash fractions having different time-temperature histories. In this presentation some examples are given how submodels for chemical equilibrium calculations can be combined with simple assumptions about particle composition and distribution between different ash streams.