An exploratory study of alkali sulfate aerosol formation during biomass combustion - DTU Orbit (16/12/2018)

**An exploratory study of alkali sulfate aerosol formation during biomass combustion**

It is still in discussion to what extent alkali sulfate aerosols in biomass combustion are formed in the gas phase by a homogeneous mechanism or involve heterogeneous or catalyzed reactions. The present study investigates sulfate aerosol formation based on calculations with a detailed gas phase mechanism. The modeling predictions are compared to data from laboratory experiments and entrained flow reactor experiments available in the literature. The analysis support that alkali sulfate aerosols are formed from homogeneous nucleation following a series of steps occurring in the gas phase. The rate-limiting step may be the oxidation of sulfite to sulfate, rather than the oxidation of SO2 to SO3 proposed previously. Even though the proposed model is consistent with experimental observations, experiments in a rigorously homogeneous system are called for to test its validity.

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