Simulation of fine dust emission from coal combustion

Abstract:
A simulation model for fine dust evolution from pulverized coal is presented and validated against experimental data. The simulation model has been developed in Matlab and is based on a sectional discretization of the general dynamic equation. Different release mechanisms and models for homogeneous condensation are investigated. Based on a parameter variation, the best suitable model is identified. With the chosen model an iterative solution, based on a minimization algorithm, is developed in order to investigate the release mechanism. The results are validated with experimental results obtained from an entrained flow reactor. Particle sampling and sizing was carried out with an electrostatic lowpressure impactor after combustion. The model is able to use different condensation models and is able to predict the released amount per size class. Best results are obtained when the classical condensation theory is applied and the release of minerals is from small particles.

Stichworte:
Fine dust, coal combustion, Matlab, condensation, simulation, entrained flow reactor

Kongress- / Buchtitel:
The 40th International Technical Conference on Clean Coal & Fuel Systems
Jahr: 2015
Revied: nein
Sprache: en
Publikationsform: Print
TUM Einrichtung: Lehrstuhl für Energiesysteme
Occurences: · Einrichtungen > Fakultäten > Fakultät für Maschinenwesen > Institut für Energietechnik > Lehrstuhl für Energiesysteme (Prof. Sliethoff) > Publikationen > 2015
entries: