

Thermochemical Qualification of Rheinisch Lignite Used for Coal Dust-fired Boilers

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ABSTRACT

RWE Power, one of the largest electricity producers in the Federal Republic of Germany, operates in the tri-city-area Cologne - Düsseldorf - Aachen (Rhenish district) four large power plants.

Those power plants are fed with lignite from its own three opencast mines. The opencast mine Inden, supplies the power plant Weisweiler whereas the power plants Frimmersdorf, Neurath and Niederaussem are supplied by the opencast mines Garzweiler and Hambach.

In order to avoid incidences caused by fouling and slagging the power plants can be alternatively fed with lignite from Garzweiler and Hambach or with mixtures of both coals via the RWE-owned railway.

This requires a precise coal qualification for each power unit to avoid slagging. In addition to the time-consuming characterization of the coals by laboratory tests it is possible to calculate convincing key figures from elemental analyses of coal ashes which are included in the deposit database using FactSage.

Thus, it is possible to calculate the amount of liquid phase at certain temperatures as well as the composition and viscosity of the liquid phase as a function of the temperature. Within this presentation it will be shown that the key figures are calculated with a sufficient accuracy.

Furthermore, it will be shown that the values of the key figures are significantly different depending on the source of the coal by means of different opencast mines and also in case of coal mixtures, respectively. In addition, the influence of the gas phase and the release of solid mixed phases on the results of the calculations will be presented.