

CO-COMBUSTION OF COAL AND A REENGINEERED FEEDSTOCK FOR EMISSIONS REDUCTION

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Coal combustion is the most common heat supply process for electricity generation in the power plants in countries such as the United States and China. Conversely, there are serious environmental problems due to release of emissions such as mercury, SO_x and NO_x that cause formation of acidic rains as a result of contact with humidity. Concentration of these emissions in the outlet of coal-fired boilers is usually larger than the permitted limits. As an example, concentration of SO_2 and NO_2 from coal combustors before gas cleaning is 200–2000 and 800 ppm, respectively.

Although there are gas-cleaning technologies such as scrubbing and absorption, installation and operation of such technologies will impose huge capital and utility costs to these existing power plants. As an alternative, a ReEngineered FeedstockTM (ReEFTM) was developed by Accordant EnergyTM to reduce the emissions in-situ through its co-firing with coal. ReEFTM is composed of combustible components of municipal waste such as hard plastic, soft plastic, and fiber including alkali (Na or K) or earth alkali (Ca) bearing sorbents.

Emissions reduction after co-combustion of coal with different types of ReEFTM, performed on fluidized bed reactors at temperatures below 1000 °C, is presented. In addition, influence of the sorbents on quality of fluidization versus efficiency of emissions reduction is presented.