



The combustion characteristics of an anthracite coal in 2MWe Oxy-CFB boiler

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The world economic and population growth has led to increase the world energy consumption. Even though renewable energy would be increasing in the world, the usage of coal might increase due to large reserves, convenient extraction and transportation, easy operation, and lower cost. Therefore, clean coal technologies should be applied to reduce the emission of greenhouse gases. Especially, anthracite coal of which combustion reactivity is lower than those of other type coals have to be used in clean coal technologies. In this study, an oxy-circulating fluidized bed combustion(Oxy-CFBC) with carbon capture and storage is analyzed because the Oxy-CFBC might be a promising solution for anthracite coals. This study aims to suggest optimized operational conditions for pilot plant by using simulation results in a 2MWe Oxy-CFBC boiler for anthracite coal. For this purpose, IEA-CFBC code was used to investigate of the effect in CO₂ concentration (64%-79%), temperature (700°C-900°C) and coal properties. As the content of N₂ and S in the coal is increased, SO_x and NO_x are emitted more. Also, it was confirmed that SO_x and NO_x emission gradually increased with increasing temperature. In the case of limestone, it was confirmed that increased of the desulfurization efficiency with increased of the specific surface area, Ca/S ratio, temperature.

