

Combustion Characteristic Study on Oxy-Fuel in 100kW Boiler

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The Combustion of coal in a mixture of pure O₂ and recycled flue gas is one of a novel combustion technology called oxy-fuel combustion. With the absence of N₂, this technology leads to a flue gas stream highly enriched in CO₂. It can accommodate capture and sequestration of CO₂, while simultaneously reducing NO_x emission. When coal is burned in this O₂ and CO₂ rich environment, its combustion characteristics can be very different from conventional air-fired combustion. To this end detailed comparisons of coal combustion in air and the mixture of O₂/CO₂ have been experimentally and numerically investigated in a 100kW test boiler. From the systematic analysis, the optimum amount of recycling CO₂ has been determined to replace the volume of the missing N₂ gas and control the flame temperature affected by turbulent mixing.