

Incineration of Sludge in a Fluidized-Bed Combustor

Authors : Chien-Song Chyang, Yu-Chi Wang

Abstract : For sludge disposal, incineration is considered to be better than direct burial because of regulations and space limitations in Taiwan. Additionally, burial after incineration can effectively prolong the lifespan of a landfill. Therefore, it is the most satisfactory method for treating sludge at present. Of the various incineration technologies, the fluidized bed incinerator is a suitable choice due to its fuel flexibility. In this work, sludge generated from industrial plants was treated in a pilot-scale vortexing fluidized bed. The moisture content of the sludge was 48.53%, and its LHV was 454.6 kcal/kg. Primary gas and secondary gas were fixed at 3 Nm³/min and 1 Nm³/min, respectively. Diesel burners with on-off controllers were used to control the temperature; the bed temperature was set to 750±20 °C, and the freeboard temperature was 850±20 °C. The experimental data show that the NO emission increased with bed temperature. The maximum NO emission is 139 ppm, which is in agreement with the regulation. The CO emission is low than 100 ppm through the operation period. The mean particle size of fly ash collected from baghouse decreased with operating time. The ration of bottom ash to fly ash is about 3. Compared with bottom ash, the potassium in the fly ash is much higher. It implied that the potassium content is not the key factor for aggregation of bottom ash.

Keywords : bottom ash, fluidized-bed combustion, incineration, sludge

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