

Prediction of ash deposition rate in entrained flow gasifier applied UDF

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When solid fuel and coal contained inorganic mineral matter burned (including partial oxidation, gasification), the inorganic compounds form an incombustible ash residue. In region above the ash fusion temperature, coal ash melts and slagging is produced. The slagging of heat transfer surfaces during the reaction of pulverized coal in gasifier is major problem like corrosion. So, It is important to predict slagging propensity. Many research have been proposed models including prediction of the ash deposition rate for slagging propensity. Most models suggested an important issue in ash deposition is the interaction of the particle colliding with the solid and slag layer.

In this study, a numerical model to predict ash deposit rates in gasifier has been developed. The deposition model is based on the sticky of ash particles on impaction on walls. The ash particle viscosity is used to determine the deposition rate at impaction on the gasifier wall because of ash viscosity as the most influential physical factor on ash stickiness. The critical viscosity temperature is applied as criterion of ash stickiness in user defined function.