

Gasification characterization of coal water ethanol slurry in an Entrained Flow Gasifier

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In this study, the gasification performance of coal water ethanol slurry (CWES) was estimated in a pilot-scale entrained flow gasifier. CWES was prepared by adding ethanol into coal water slurry (CWS) to estimate gasification performance of bio-ethanol-contained coal water slurry. Compared with CWS gasification, gasification with CWES showed higher performance, such as composition of hydrogen and carbon monoxide, carbon conversion, cold gas efficiency, and total flow rate of syngas. In general, the gasification performance is directly associated with carbon content of CWS, and it is very difficult to increase the carbon content of CWS while maintaining slurry viscosity to the atomizable level (2,000 cP). However, in the case of CWES, the carbon content of slurry can be readily improved and the viscosity of slurry can be reduced at the same time. Thus, the improved carbon content of CWES led to higher gasification performance than that of CWS.