

Behavior of Coal Particles in Entrained-Bed Gasifier

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Fines from the one-stage entrained-bed coal gasifier of pilot-scale 1 ton/day contain 20–70% remaining carbon. In this case, final fines might be applicable for another low-grade fuel if combustibility and other criteria are satisfactory, or a specialty fuel that does not contain volatiles with high surface area. The pilot-scale coal gasifier which was designed to complete the conversion in one pass through the gasifier normally produced 1–5 wt% of feed coal powder as entrained fines. In terms of carbon conversion, typically more than 97% has reached. Although the internal recycle amount of reacted fines to the gasifier can reach more than 50% in two-stage gasifiers, actual amount of fines and slag remains at the ash amount in feed coal plus a small portion of un-reacted carbon which is below than 1–3 wt% of total carbon. In the study, remaining carbon in fines and their physical characteristics were evaluated for the samples obtained from a non-slugging gasifier with slags from the same coal. In short, in order to compare and verify the applicability of fines from the non-slugging gasifier as a useful by-product, an Indonesian subbituminous coal was gasified in the 1 ton/day scale non-slugging gasifier.