

Effect of bed materials on biomass gasification in a Dual Fluidized Bed

구정희, 서명원, 김상돈*, 송병호¹
한국과학기술원; ¹군산대학교
(kimsd@kaist.ac.kr*)

The dual fluidized bed biomass gasification is a promising technology to produce synthesis gas ($H_2 + CO$) having a medium heating value without N_2 dilution. In this study, a dual fluidized bed gasifier (DFBG) which consists of a riser (0.078 m-I.D x 8.6 m-high) as a combustor and in a bubbling bed as a gasifier (0.2 m-I.D. x 2.1 m-high) was operated. Sawdust was fed as biomass feed. Gasification characteristics depending on reaction temperature (750–900°C), steam/biomass ratio (0.1–0.7) and bed materials (silica sand, CaO) were determined. Product gas compositions of H_2 and CO using silica sand were 38–52% and 22–26%, respectively. When CaO was fed, over 60% of H_2 could be obtained but CO and CO_2 was decreased. This is why water-gas shift reaction is dominant by CO_2 absorption of CaO. From this study, CaO as bed material has advantages for high purity H_2 production and tar reduction.