

Characteristics of Low Temperature Gasification of Victorian

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Abstrak

The conventional method of generating energy is by means of combustion puts significant pressure on the environment. Therefore the study of gasification is needed. Low temperature gasification produces synthetic gas as a fuel or material to produce chemicals in industry. This study investigated the gasification characteristics of Victorian brown in terms of reaction competition and structural changes happen. It was found that as the concentration of oxygen reaches 5% and 6 second residence time, char yield goes to as low as 45 % to 25 % . , the char yield decreases, which indicates more synthetic gas was produced in the reaction. The structural changes of char during gasification were also observed, results shows the reaction mechanism of char as it goes through gasification. This is illustrated by the BET surface area, pore volume and also the pore size. In CO₂ dominated reaction, the surface area goes as high as 240 m²/g to 180 m²/g due to char fragmentation and promptly decrease to around 170 m²/g, while in O₂ reaction the surface area dropped to around 160 m²/g. SEM analysis shows considerable increase in the frequency of char particles which diameter smaller than 120 microns (from 0.27 to 0.36 for particle smaller than 100 microns and from 0.28 to 0.35 for particle at 100 to 120 microns). While there is a noticeable decrease in the frequency of larger particle (0.26 to 0.19 for 120 to 140 microns, 0.09 to 0.06 for 140 to 160 microns and 0.1 to 0.03 for larger than 160 microns)