

## CO<sub>2</sub> Gasification Rate Analysis of an Indonesian Coal Char at Elevated Pressure

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The intrinsic reaction kinetics, analyzed from nth order and Langmuir-Hinshelwood reaction rate equations, obtained from PWHR was verified as comparing with TGA. The internal/external effectiveness factor and the extent of surface coverage were applied to study the effects of high pressure(up to 30atm) and temperature(up to 1723K) on char-CO<sub>2</sub> gasification. The inhibition effect of CO was studied at elevated CO partial pressure in total 20atm in the chemical reaction and pore diffusion regimes. The results showed that The intrinsic activation energies based on nth order reaction rate equation are 152kJ/mol(obtained from TGA, 75um char particle ), 150kJ/mol (obtained from TGA, 800 um char particle) and 149.2kJ/mol(obtained from PWHR, 800 um char particle). In the elevated pressure condition, nth order equation at the high temperature(1573K, pore diffusion regime) is the same trend to adsorption control of L-H equation which is lower surface coverage, and one at the low temperature(973K, chemical regime) is the same trend to desorption control which is higher surface coverage.