

### Coal Gasification in Steam + CO<sub>2</sub> Mixtures using mineral catalysts

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In this study, the coal gasification using Steam + CO<sub>2</sub> mixtures was investigated and the synergistic effect in catalyst coal gasification was revealed. The gasification experiments were conducted over a temperature range of 800–900 °C at atmospheric pressure. Adaro coal was mixed three mineral catalysts such as Dolomite, Silica sand and Kaolin. Experimental samples were then gasified four environments ranging from pure CO<sub>2</sub> 300 cc/min to pure Steam 300 cc/min in 100 cc/min increments. The results suggest that the addition of CO<sub>2</sub> improved the char reactivity, which is higher than the sum of the individual reactivity using either Steam or CO<sub>2</sub>. The modified volumetric reaction model of the gas–solid reaction was applied to the experimental data to obtain kinetic information. The catalytic activity of single catalysts followed the sequence Dolomite > Kaolin > Silica sand > No catalyst. Using Steam + CO<sub>2</sub> mixtures gas in gasification and catalytic activity of Dolomite was the critical factor.