

### Catalytic performance on CuO-Cr<sub>2</sub>O<sub>3</sub>-Ga<sub>2</sub>O<sub>3</sub> mixed oxides for water gas shift reaction: effects of Ga/Cr molar ratio

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Water gas shift (WGS) reaction was carried out on the co-precipitated CuO-Cr<sub>2</sub>O<sub>3</sub>-Ga<sub>2</sub>O<sub>3</sub> mixed oxides by varying the molar ratio of Ga/Cr using metal nitrate precursors and Na<sub>2</sub>CO<sub>3</sub> precipitant. The catalytic was prepared at the fixed molar ratio of Cu/(Cr+ Ga) at 1.0/0.1 with the different Ga/Cr ratio from 0 to 4. The catalytic performance on the reduced CuO-Cr<sub>2</sub>O<sub>3</sub>-Ga<sub>2</sub>O<sub>3</sub> mixed oxides is found to be in the shape of volcano curve with respect to the variation of Ga/Cr molar ratio. The highest catalytic activity was observed at the molar ratio of Ga/Cr = 1.0 in the temperature ranges of 160 – 280 oC. The observed catalytic activities are strongly related with the metallic surface area and crystallite size of Cu species which are confirmed by XRD and N<sub>2</sub>O titration method.