

Methanol Synthesis over Cu-ZnO-Al₂O₃-ZrO₂-SiO₂ Catalysts Prepared by Different Methods

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Methanol synthesis is one of the promising processes in the chemical engineering field as utilization of gas to liquid technologies particularly from syngas.

In this work, Cu-ZnO-Al₂O₃-ZrO₂-SiO₂ catalysts have been prepared by different methods such as impregnation, co precipitation, hydrothermal and polyol reduction methods. All catalysts have been characterized by BET surface area, TPR, TG/DTA, XRD and XPS for structure elucidation.

All catalysts were examined for methanol synthesis from syngas under 40 bar pressure, with GHSV 3500 h⁻¹. The characterization results considered that the preparation method of catalysts can be changed the dispersion of metal, metal-support interactions and particle size of active species. The results suggest that the method of preparation is played a crucial role in the CO hydrogenation and methanol yield.