

Pussorn Akkarapreechakul 2015: Synthesis of Methanol from CO₂ Hydrogenation over CuO/ZnO/MWCNTs Catalysts. Master of Engineering (Advanced and Sustainable Environmental Engineering), Major Field: Advanced and Sustainable Environmental Engineering, Faculty of Engineering. Thesis Advisor: Assistant Professor Thongthai Witoon, D.Eng. 57 pages.

In this study, multi-wall carbon nanotubes (MWCNTs) was used to improve the catalytic performance of CuO/ZnO catalyst for methanol synthesis from CO₂ hydrogenation. The surface of MWCNTs was treated with different types of acid. The CuO to ZnO ratio was fixed at 1 and the MWCNTs content was varied from 0 to 80 wt%. The CuO/ZnO/MWCNTs catalysts were prepared by co-precipitation method and were characterized by means of N₂-sorption, Raman spectroscopy, FT-IR, XRD, SEM, TEM, TPR and N₂O pulse chemisorption. The dispersion of CuO and ZnO particles was found to be improved by acid treatment of MWCNTs. The CuO/ZnO/ MWCNTs catalysts with 60 wt% MWCNTs gave the highest yield of methanol of 104 g_{methanol}/(kg_{catalyst}h).

Student's signature

Thesis Advisor's signature

____ / ____ / ____