Methanol Synthesis over the Mg modified Cu/ZnO/Al_2O_3 Catalysts via different preparation methods

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The objective of this research is to investigate the effect of Mg on the performance of Cu/Zn/MgO/Al2O3 catalysts, which made by a variety of methods. In this research, the methanol synthesis reaction over Mg promoted Cu/ZnO/ Al2O3 catalysts prepared via co-precipitation, impregnation and Sol-Gel method. The prepared catalysts were characterized by N2 adsorption, XRD, TPR, N2 Pulse technologies. The methanol synthesis reaction was carried out at T = 240 °C, P = 50 bar, GHSV = 4,000 h-1 and H2/CO = 2 in a fixed bed reactor. The Cu dispersion and surface area of the Mg modified catalysts were improved with the addition of Mg than Cu/ZnO/Al2O3 catalysts. Mg modified Cu/ZnO/M/Al2O3 catalyst show lower MeOH yield than Cu/ZnO/Al2O3 but higher stability than Cu/ZnO/Al2O3 catalyst.