Performance of spinel ferrite catalysts supported on mesoporous Al_2O_3 for high temperature water-gas shift reaction

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The present study focuses on the use of spinel ferrite (MFe_2O_4) catalysts supported on mesoporous alumina for the high temperature water-gas shift (WGS) reaction. High temperature WGS reaction has been carried out at a gas hourly space velocity of 41,821 h^{-1} over MFe_2O_4 catalysts prepared by the sol-gel method using a non-ionic template. Ni, Co, Fe, or Cu were employed as active metal for the target reaction in this study. Among these catalysts, copper ferrite supported on mesoporous alumina ($CuFe_2O_4$−MA) exhibited outstanding performance. The reason for the higher activity of $CuFe_2O_4$−MA might be a promotional effect of Cu on the reduction of hematite to magnetite, shifting it to a lower temperature, and better dispersion of CuO over the mesoporous alumina support.