

Studies on CrO_x/La₂O₃/ZrO₂ catalysts modified by Mg

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Lanthana–zirconia supported chromium oxide and magnesium chromium mixed oxide catalysts were studied in the dehydrocyclization of n-octane and characterized by temperature-programmed desorption of NH₃, temperature-programmed reduction, XPS and DRIFTS. The Mg-free catalyst shows the highest activity, but suffers from rapid deactivation due to coke formation. The addition of Mg decreases the initial activity of the supported chromium oxide and retards its deactivation. The characterization results reveal that the deactivation retarding effect of Mg species not only consists in the deletion of strong acid sites but also in the decoration and/or dilution of Cr³⁺ oxide cluster, supposedly due to the formation of Mg–Cr surface compounds and, thus, in preventing the formation of coke.

KEY WORDS:

dehydrocyclization; lanthana–zirconia support; chromium oxide catalysts; chromium-magnesium-lanthanum oxide catalysts; catalyst characterization; coke deposition.