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Hydrodenitrogenation and Hydrogenation of Aromatic Compounds over Titania Supported Cobalt Molybdenum Catalysts

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Newly developed CoMo titania catalysts for ultra-deep hydrodesulfurization (HDS) of diesel oil have higher activities for both HDS and hydrodenitrogenation (HDN), whereas the chemical hydrogen consumption is almost the same or lower than that of alumina supported catalysts. The HDN reaction routes of a model nitrogen compound and the hydrogenation activities of a model aromatic hydrocarbon compound over CoMo titania catalysts and commercial CoMo and NiMo alumina catalysts were investigated using carbazole dissolved in toluene as the feedstock. Toluene was used as the representative of aromatic hydrocarbon compounds which account for about 30% of diesel oil. The HDN reactions over each catalyst proceeded by the same reaction routes for hydrogenation of the aromatic rings of carbazole. However, the hydrogenation activity of toluene over the CoMo titania catalysts was lower than that over alumina supported catalysts. It is considered that the chemical hydrogen consumption of the CoMo titania catalyst is less than that of alumina supported catalysts, because hydrogenation of aromatic hydrocarbon compounds in diesel oil is selectively restricted over the CoMo titania catalyst.

Keywords: [Titanium dioxide support](#), [Cobalt molybdenum catalyst](#), [Hydrodesulfurization catalyst](#), [Carbazole hydrodenitrogenation](#), [Reaction kinetics](#), [Toluene hydrogenation](#)

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