Hydroformylation of 1-alkenes catalyzed by rhodium supported on MCM-41: effect of $H_3PW_{12}O_{40}$ on the catalytic activity and recycling.

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Abstract

Heteropoly acids impregnated with rhodium(I) or -(III) complexes were prepd. and used as supported catalysts in the hydroformylation of terminal alkenes. Two general types of catalysts were prepd. and tested: rhodium(I) or -(III) in the presence and in the absence of the heteropoly acid $H_3PW_{12}O_{40}\cdot 25H_2O$ (HPW12) supported on MCM-41 (30 .ANG.). 1-Octene was chosen as a model substrate. Different types of supported catalysts were tested in the hydroformylation of 1-octene and other terminal alkenes. The effects of temp. and solvent on the reaction were studied. The supported catalysts contg. HPW12 along with rhodium(I) or -(III) showed higher catalytic activity. In addn., the recycling of the supported catalysts was studied, and the results showed again the important effect of the presence of HPW12 on the recycling of the rhodium catalysts.