

The Chemical Nature Of Supported Vanadium Oxide

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Vanadium oxide supported on alumina, silica, titania, zirconia, and other oxides is one of the most extensively studied catalyst materials. The catalytic performance of supported vanadia has been investigated for a variety of hydrocarbon transformations, especially the oxidative dehydrogenation of alkanes and the oxidation of methanol in order to establish the relationship between the chemical, physical, and structural nature of supported vanadia and its catalytic function. In recent work at Northwestern University and Argonne National Laboratory new spectroscopic, catalytic and computational studies point to a rich chemistry for supported vanadium oxide. The structure and catalytic properties are shown to be sensitive to the method of preparation and the structure of the support. There is recent evidence on the incorporation of hydroxyl groups into supported vanadia species. New resonance Raman spectroscopy measurements comment on the nature of supported vanadium oxide electronic structure and bond energies. This talk will highlight some of these new results in order to emphasize the questions regarding the nature of supported vanadium oxide that still remain to be answered.