

Synthesis and Characterization of Modified $V_2O_5/TiO_2-Al_2O_3$ xerogels

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Vanadia supported on titania is a well-known catalyst for selective oxidation and ammoxidation of hydrocarbons. Titania has been used as an efficient catalyst support but it has some drawbacks such as low surface area, poor mechanical strength and thermal stability. On the other hand alumina has high surface area, good mechanical strength and thermal stability. In order to utilize such favorable properties of alumina, we have tried to prepare $TiO_2-Al_2O_3$ composite xerogels. The present work is focused on the synthesis of $V_2O_5/TiO_2-Al_2O_3$ xerogels using a modified sol-gel method to obtain highly active ammoxidation catalysts with highly dispersed vanadia species on the support surface. The conventional sol-gel complexation method led to lower amounts of vanadia surface species than this novel sol-gel method due to inherent uniformity of the sol-gel materials, which was confirmed by TPR and XRD. TPR results indicated that hydrogen consumption of modified xerogels is higher than that of conventional xerogels. Besides, XRD results of modified xerogels exhibited characteristic peaks of crystalline V_2O_5 .