Characterization of Cr supported on hierarchical alumina with high Cr content

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Cr supported catalyst has been used extensively in the production of C4 olefin from butane. The preparation method of the corresponding catalyst has been of great interest because of high Cr contents, 18 - 20 wt%. In the present work, the hierarchical alumina containing micro, meso and even macro-size pore was employed as a catalyst support. The Cr precursor was impregnated repeatedly on the hierarchical alumina. The obtained Cr catalyst was characterized with X-ray powder diffraction, X-ray photoelectron spectroscopy, extended X-ray absorption fine structure and transmission electron microscopy. The result showed that the particle size of Cr active site, mainly Cr_2O_3 was around 1 nm, corresponding monolayer coverage when the multiple impregnation method was employed.