



**Manganese, iron and sulfur  
K edge XAFS of promoted sulfated zirconia catalysts**

**Jentoft RE, Hahn A, Jentoft FC, Ressler T**

Jentoft RE, Max Planck Gesellschaft, Fritz Haber Institut, Dept Inorgan Chem,  
Faradayweg 4-6, D-14195 Berlin, Germany

**Abstract:**

Promoted sulfated zirconia samples were prepared by the incipient wetness technique to produce isomerization catalysts which were active for the conversion of *n*-butane to isobutane at 338K (up to 10% conversion of 1% *n*-butane, 1atm., 0.25 h<sup>-1</sup> WHSV). The local structure of Fe and Mn in promoted sulfated zirconia was investigated using fluorescence yield XAS. Spectra were taken of calcined samples, activated samples, and samples after reaction with *n*-butane (maximum activity and deactivated). Factor analysis reveals that the Mn K edge XANES can be described by a linear combination of the spectra of two separate components, and that the ratio of these components changes with activation of the catalyst, and during use in the *n*-butane isomerization reaction. The change in ratio of the Mn species during activation and reaction results in a reduction of the average Mn valence from 2.4 to 2.2. The Fe K edge XANES was not similarly affected by activation and reaction with *n*-butane.