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# ***n*-Butane Isomerization Catalyzed by Sulfated Zirconia Nanocrystals Supported on Silica or $\gamma$ -Alumina**

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## **Abstract**

Supported sulfated zirconia catalysts with zirconia contents of 10, 20 and 50 wt% were prepared by impregnation of SiO<sub>2</sub> and  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> supports with H<sub>2</sub>SO<sub>4</sub>/Zr(SO<sub>4</sub>)<sub>2</sub> solutions followed by calcination at 923 K. The catalysts were characterized by X-ray diffraction, extended X-ray absorption fine structure measurements, thermal analysis, UV–vis spectroscopy, and electron microscopy. Tetragonal zirconia was detected in all silica-supported samples but only in the 50 wt % zirconia-containing alumina-supported sample, indicating high dispersion of zirconia on alumina. Alumina-supported samples retained additional sulfate, at least in part as Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub>. All samples were active in *n*-butane isomerization (1kPa *n*-butane, 378 K). There was no relation between the presence of tetragonal zirconia in these samples and the catalytic performance.

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**Running title:** Isomerization by zirconia nanocrystals