

## **491g N-Octane Aromatization over Pt Supported on Small Crystal of KL Zeolite**

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n-Octane aromatization can yield C8-aromatics, i.e., ethylbenzene (EB) and xylenes which are essential raw materials in petrochemical industry. The ratio of o-Xylene (OX) to EB produced over a given Pt/KL catalyst can be used as a measure of the extent of secondary hydrogenolysis inside the pore. In previous work we have proposed that a EB/OX ratio close to unity should be observed on a catalyst with short diffusion path, since the C8-aromatics are not subject to further reaction before escaping the zeolite. By contrast, a low EB/OX ratio shows a preferential hydrogenolysis of the molecule that diffuses more slowly through the pores (EB). In this work, a small crystal (0.2 micron ) KL zeolite was synthesized using the microwave hydrothermal technique. The crystallite size is significantly smaller than that of the commercial (Tosoh) KL zeolite (0.5 micron). The synthesized and commercial zeolites were loaded with Pt by vapor phase impregnation at various loadings. Results revealed that 1%Pt/commercial zeolite had a high Pt dispersion with Pt clusters located inside the pore of zeolite. The synthesized zeolite with 0.6%Pt loading gave a higher dispersion than that with 1%Pt. The catalysts were tested for n-octane aromatization at 500°C at 1 atm. On the Pt/synthesized KL, the overall activity was lower than on the Pt/commercial KL. However, the selectivity to C8-aromatics and the EB/OX ratio were higher, which indicates that the effect of pore restriction and secondary hydrogenolysis become less pronounced with the small crystallite size.

Keywords: small particle size KL zeolite, microwave hydrothermal technique, vapor phase impregnation, EB/OX ratio