113-022

THE EFFECT OF GALLIUM SUPPORTED ON MESOPOROUS SILICA AND ITS CATALYTIC ACTIVITY FOR OXIDATION OF BENZENE, TOLUENE AND O-XYLENE

Schwanke, A.J.(1); Balzer, R.(2); Pergher, S.(1); Probst, L.F.D.(3);
Universidade Federal do Rio Grande do Norte(1); Universidade Federal do Paraná(2); Universidade Federal do Rio Grande do Norte(3); Universidade Federal de Santa Catarina(4);

Benzene, toluene and xylene (BTX) are a particular class of volatile organic compounds, which are highly toxic pollutants. In this study, samples of gallium-containing mesoporous silica (MS-Ga7% and MS-Ga11%) were synthesized and their catalytic activity in the oxidation of BTX was investigated. The physicochemical characterization by XRD, XPS, XRF, nitrogen adsorption and desorption isotherms at 77K, FTIR, SEM and TEM shows that the inclusion of gallium in the mesoporous silica structure leads to an increase in the number of oxygen vacancies in the structure of the MS-Ga system, which can result in an increase in the total and surface oxygen mobility. The results show the highest conversion for benzene (65%), with >40% for toluene and >28% for o-xylene. The high catalytic activity observed was attributed to a combination of several factors including a higher number of active sites (gallium and gallium oxide) being exposed, with a greater mobility of the active oxygen species on the surface of the catalyst promoting the catalytic activity. Keywords: Gallium. Mesoporous silica. Catalytic oxidation. BTX.