

Liquid-phase propylene epoxidation using H_2O_2 on Titania-silicate catalysts in Micro-reactors

주천용, 김현중, 설용건*
연세대학교 화학공학과
(shulyg@yonsei.ac.kr*)

Propylene oxide (PO) is an important chemical feedstock to manufacture. PO has been industrially produced by the Chlorohydrin process and Organic hydroperoxide processes. However these processes produce environmental unfriendly products. These processes are consist of two-step reaction. The chloro-hydrin process produces environmental unfriendly chlorinated by-products and hydro-peroxide process produces a large amount of side products such as *t*-butyl alcohol or styrene. DOW and BASF have recently developed more environmental friendly process in which liquid phase H_2O_2 is used in the presence of TS-1.

In this study, various Titania-silicate catalysts (TS-1, Ti-MWW, Ti-MCM-41, Ti-SBA-1, TiO_2/SiO_2) are synthesized and measurements epoxidation of propylene in micro scale reactors. The reaction was maintained at 333K for 3hours with shaking. The reaction products were analyzed by GC/MS. Titania-silicate catalyst(TiO_2/SiO_2) show higher activity for epoxidation than TS-1(conversion: 85.2%, selectivity: 1.17) .