

## Oxidation of Styrene over Nanoporous Nickel Phosphate VSB-5 using Urea-Hydrogen Peroxide as Oxidizing Agent

이 석, 박상언\*  
인하대학교 화학과  
(separk@inha.ac.kr\*)

In this work, we report new results of the investigation on VSB-5 framework, for its interesting catalytic property for the epoxidation of olefins using urea-hydrogen peroxide as oxidizing agent. We found that styrene conversion as well as the selectivity for the desired epoxide increases when instead of aqueous hydrogen peroxide urea-hydrogen peroxide is used. Probably, the urea acts not only as a dehydrating agent but also as a buffer for the system, which prevents further isomerization and hydrolysis of the desired product. Conversion is found to be directly proportional to hydrogen peroxide/styrene molar ratio. The iron located inside the framework of VSB-5 was stable toward leaching for a long time. A comparative study was made for this reaction with that of VSB-5 without iron.

This hybrid material behaves as an effective heterogeneous catalyst for the epoxidation of styrene-to-styrene oxide with urea-hydrogen peroxide as oxidant. Further studies are in progress to explore the redox catalytic properties of iron substituted Nickel Phosphate, Fe-VSB-5.