

Preparation of ceria-based mixed oxides by continuous supercritical hydrothermal synthesis and their application to wet oxidation of phenol

김경훈, 임선기*
한국과학기술원
(skihm@kaist.ac.kr*)

A series of ceria-based mixed oxides was prepared by continuous supercritical hydrothermal synthesis, which is a method to prepare highly crystalline nanoparticles of homogeneous complex metal oxides as well as single metal oxides rapidly and continuously using supercritical water as antisolvent. The incorporation of even relatively small amounts of Zr, Mn or Cu into the fluorite structure of ceria strongly enhanced the redox properties of the material with a consequent promotion of the oxidation activity. The prepared mixed oxides were used as catalysts in the wet oxidation of phenol solution and their catalytic activity and selectivity were measured. Also, their stability was examined by analysis of metal ion concentration in the treated phenol solution after reaction.