Perovskite-type oxide catalyst $LaCoO_3$ prepared by supercritical synthesis

서명지, 김정랑, 전주원, 임선기*
KAIST
(skihm@kaist.ac.kr*)

Perovskite-type oxide $LaCoO_3$ as a substitute of noble metal catalysts has high potential for their use in various oxidations. Perovskite-type oxides require high calcination temperature (>900℃) for forming perovskite structure and hence yield with low surface area (<5 m^2/g) due to sintering.

Continuous hydrothermal synthesis in supercritical water (supercritical synthesis) 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.

In this research, samples were prepared by the new supercritical synthesis with additive and also by the conventional co-precipitation method. The perovskite structure was conformed by XRD. The well-crystallized oxide $LaCoO_3$ was obtained at a higher calcination temperature (800℃). And the specific surface area of the oxide was estimated using the BET method from nitrogen adsorption isotherm. The surface area of the oxide prepared by the supercritical synthesis with additive was higher than that of the oxide prepared by the conventional co-precipitation method.