Aerosol Solvent Extraction System(ASES) using Supercritical CO₂ as Surface Modified Cerium Oxide Drying Process

<u>손원수</u>, 윤용석, 이윤우* 서울대학교 (ywlee@snu.ac.kr*)

In industry, Cerium oxide(CeO_2) is synthesized for various purposes. When CeO_2 is synthesized, it is obtained as colloid suspension in organic solvent with residual organic material which was used for controlling size and morphology of particle. When CeO_2 is stored in organic solvent, various problems can be occurred. Therefore, it is necessary to store CeO_2 nanoparticle as dried solid. Although hot air drying is easily used as drying process of metal oxides, capillary force between liquid and vapor interface can damage on nano-structure of CeO_2 . To avoid this problem, freeze drying is suggested. However, long drying period is still problem. Besides, using excess organic solvent to wash out residual organic materials is inevitable in both drying processes. In this study, aerosol solvent extraction system(ASES) with supercritical CO_2 is suggested as another drying process which doesn't need additional washing process. It is competitive in points of less particle aggregation, less waste water, and less process time compared to conventional drying process. Dried cerium oxide nanoparticle was analyzed by FT-IR, XRD, and HR-TEM.