

Morphological evolution of hierarchical nickel titanates by elevation of the solvothermal temperature

Pham Thanh Truc, 신은우\*

울산대학교

(ewshin@uk.ac\*)

In this study, the morphological evolution of hierarchical nickel titanates was investigated for the first time by simply raising the solvothermal temperature. At room temperature, irregular aggregates of anatase TiO<sub>2</sub> nanoparticles were formed without a nickel titanate phase. Increasing the temperature to 100 °C resulted in the assembly of 3D drum-shaped nickel titanate clusters where the three-dimensional geometry was constructed via small coalescent nanoparticles. An intermediate stage containing circular cylinders and irregular prisms was obtained at intermediate temperatures. Further elevation of the solvothermal temperature to 160 and 180 °C gave 1D uniform hexagonal nanoprisms of nickel titanates. Increasing the solvothermal temperature accelerates the nucleation rate, which drastically promotes crystallization and self-assembly, thereby evolving to the hierarchical structure of NiTiO<sub>3</sub>.