

Synthesis and characterization of thin crystalline silica nanoplates prepared from amorphous silica nanoparticles via hydrothermal methods

문지훈, 정성욱<sup>†</sup>  
부산대학교

(sungwook.chung@pusan.ac.kr<sup>†</sup>)

$\alpha$ -Quartz nanoplates were synthesized from amorphous silica nanoparticles (ASNPs) which were synthesized via Stöber method. The reaction for synthesis was conducted through using hydrothermal method by completely resolving ASNPs in solution before the reaction. These nanoplates have thin plates and high crystallinity and show fast synthesis time within 6 hours. The  $\alpha$ -Quartz nanoplates will be important bases of research materials for electrodes of battery, and electronic or optical devices. One of the occurring phases of crystalline silica is  $\alpha$ -quartz. Their typical structure shows a shape of spherical nanoparticles exhibiting the crystal habit of  $\alpha$ -quartz. However, synthesizing novel crystalline silica possessing two-dimensional layered nanostructure has not yet been established. We report synthetic methods of preparing novel crystalline silica nanoplates from amorphous silica nanoparticles. As-prepared crystalline silica nanoplates have been characterized employing powder X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), X-ray photoelectron spectroscopy (XPS), and atomic force microscopy (AFM).