

## Characteristics of mesoporous silica nanoparticles synthesized by a simple method

*Tuesday 22 May 2018 15:45 (15 minutes)*

### Abstract

This research synthesized the mesoporous silica nanoparticles. TEOS is used as a precursor and two types of surfactant, CTAB and TTAB, to be used as structure directing agent. To compare the effect of template type on the characteristics of synthetic particles, molar ratio of precursor to template is equally controlled. The co-condensation combine with bi-phasic techniques are utilized for this synthesis. The as-synthesized particles were incinerated to remove the directing agent at about 500-800 °C under atmospheric pressure. To confirm the quality of synthesized nano-silica, characteristics of nanoparticles are characterized by several analytical techniques. Morphology, particle size and composition are analyzed by SEM and TEM, while affinity to water is analyzed by measuring the water contact angle at different position on the surface of the obtained particles. Surface area and pore volume are determined by BET technique, while crystallinity and functional groups present in the nanoparticles were analyzed by XRD and FTIR techniques, respectively. Preliminary results showed that the whiteness of silica powder increase as the incinerate temperature is increased. The synthesized silica is approximately 25-35 wt% of the initial weight of substrate. Comparison of the surface area (SA) of calcined and non-calcined particles showed that calcined silica have higher SA than non-calcine silica. As can be seen from SEM and TEM results, the synthesized particles are mesoporous silica nanoparticles. This study confirmed the synthesis of porous silica nanoparticles by a simple method.

Keywords: Characteristics; Mesoporous; SiO<sub>2</sub>; Nanoparticles; Synthesis.

**Author:** NOIPANYA, Thanapog (0979433893)

**Co-author:** Dr YUENYAO, Chalad (-)

**Presenters:** NOIPANYA, Thanapog (0979433893); Dr YUENYAO, Chalad (-)

**Session Classification:** A013: Materials Physics (Poster)

**Track Classification:** Material Physics and Functional Materials