

## Continuous one pot synthesis of organic modification of zinc oxide nanoparticles using supercritical methanol

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Supercritical methanol provides an excellent reaction medium for continuous synthesis of surface-modified nanoparticles because homogeneous metal salt solution and organic surface modifier solution can be introduced into a flow type reactor continuously, and line and filter clogging problems by unreacted, precipitated surface modifier in water at ambient condition can be avoided. In this work, continuous, one-pot synthesis of organic modification of zinc oxide (ZnO) nanoparticles in supercritical methanol was examined by using decanoic acid (C<sub>9</sub>H<sub>19</sub>COOH) or oleic acid (CH<sub>3</sub>(CH<sub>2</sub>)<sub>7</sub>CH=CH(CH<sub>2</sub>)<sub>7</sub>COOH) as an organic modifier. The usage of supercritical methanol and addition of organic modifier into the reaction system has a significant effect on the particle size and morphology. Wide angle X-ray diffraction (WAXD) analysis revealed that the surface-modified nanoparticles retained ZnO crystalline structure. Fourier transform infrared (FT-IR) spectroscopy indicated the existence of an organic layer on the surface of nanoparticles. The results of SEM and TEM images showed that the organic modification affected crystal growth.