(One page abstract format: including figures and references. Please follow the model below.)

Scalable High Throughput Synthesis of Functional Nanoparticles with a Hydrodynamically Controlled Reactor

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Abstract

A facile synthetic method was applied to prepare monodispersed uniform nanoparticles with various chemical compositions. A hydrodynamically controlled reactors forming turbulent flow for efficient chemical reaction was adopted for continuous synthesis of functional nanoparticles. The synthesis capability can be extended up to 1 liter per hour with a single reactor. Here, the continuous synthesis of various nanoparticles including oxides, chalcogenides, etc. were demonstrated with this method and detailed analysis of synthesized nanoparticles showed highly improved size distribution and well-developed nanostructures. In particular, the shape of chalcogenide nanoparticles (ex. CdSe) was successfully controlled via incorporation of additional metallic ions (ex. Pb^{2+}) during the synthesis. By controlling the amount of the metal-ionic additives, the shape and the size of synthesized nanoparticles were varied from 4nm to 30nm in length.

Figures

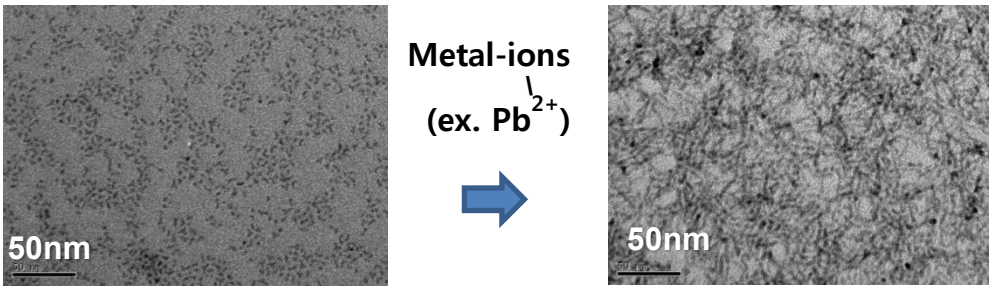

Fig. 1. Morphological control of chalcogenide nanoparticles by addition of foreign metal ions