Surface modification at nanoscale; Nanoparticle-nanowire transition

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Binary, ternary and quaternary oxides and selenides have been developed and used in multiple applications including high power lasers, detectors, dielectric energy storage and variety of optical devices. These materials have been grown by Bridgman, physical vapor transport (PVT), chemical vapor transport (CVT) methods and flux methods in the form of bulk thin film, nanocrystals and nanowires. With increasing thrust of bio applications, nanoparticles it is essential to understand nucleation and nanomorphological transition during drug delivery, growth of nanoengineered bio composites in body, grain growth and final morphology. Addition of fluorides and selenides have increased significantly in synthetic tissue constituents because of some advantages in adhesion and stability. We have performed experiments on multinary oxides Sr-Ba-O-F, Se-Tl-As and Se-Pb-Sn-Se using several growth methods to demonstrate nanoparticle and nanowire transition. This study has great potential to increase surface area and also provides understanding to the mechanism of nanowire growth.

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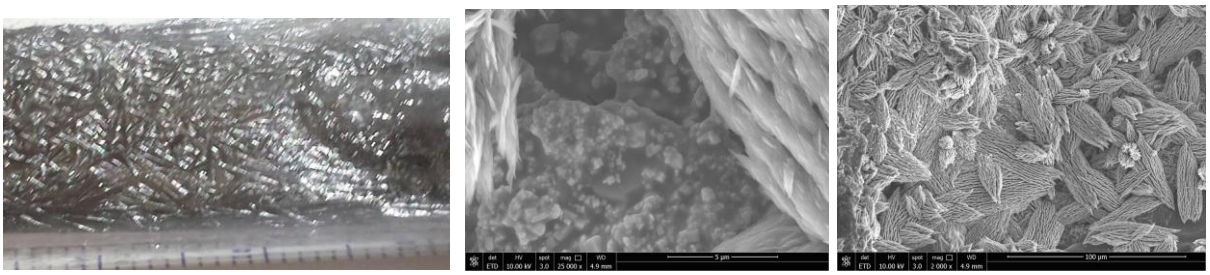

Transition of morphologies from nanoparticles to nanowire