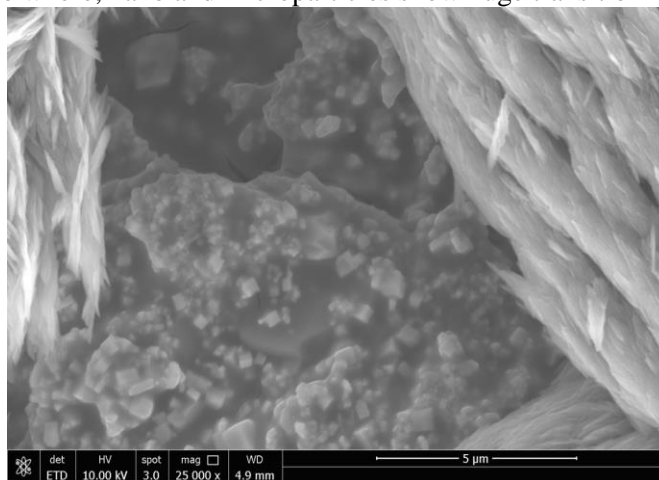


Role of a chemist in modern industries: Design and development of nanoengineered multifunctional materials

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A summary of changing role of chemist in to materials science and engineering field to design, develop and manufacture nano-micro- and bulk crystals for RF, microelectronic, electro-optic and radiation sensors will be presented. Examples of multifunctional materials and their roles will be presented.

During the past fifteen years significant investment has been made for the applications of nanotechnology in almost every aspect of life. Almost every area of research has projected improvements including biotechnology, bioinspired electronic, optical and radiological sensors, or a promise for the emergence of some novel device technologies. For such applications major focus has been placed on research nanoparticles, nanotubes nanorods and two-dimensional structures similar to that of graphene. Some near-term applications of nano particles and nanowires have produced very promising results for better synthesis of energy storage materials, design of biologically active composites like apatites, laser host crystals, photodetectors and sensor materials for radiation detection. To achieve desired morphologies, nanomaterials can be utilized some organic melt and orient the grains by the directional solidification method. The organic treated materials produce different characteristics than coarsened oxide materials. The focus is also understanding the morphology and performance function in human organs that occur because of aging or disease, and responses to interventions. We annealed to determine the changes in morphologies and hence effect of aging. In this presentation, we will discuss correlation between the designed composition, micromorphology and the performance parameters of nanomaterials. To understand the mechanism of formation of nanoparticles, nanoboloids, fibers experimental details and observations on the of multinary compounds will be presented. These observations on the transition of nanomorphology can highlight the mechanism of the phase transition in some oxides and selenides. As shown in Figure we observed that similar to the solid-liquid interface breakdown during physical vapor transport and solid-state grain growth process also where, nano and microparticles show huge transition into nanowires and fibers.



Transition of nanomorphology to shaped and fiber morphology