

Preface

Solid state and liquid diffusion of atoms and molecules plays a very important role in the formation of nanoparticles and nanocrystalline materials. Since such materials are metastable, the degree of diffusion also effectively determines their functional properties and longevities. Moreover, because of the large fraction of atoms at external and internal surfaces in such materials, the diffusion mechanisms frequently differ considerably from those that have been established for bulk systems. Accordingly, this area has attracted a great deal of attention in recent years.

This topical volume of the Journal of Nano Research captures a very broad cross-section of the synthesis and functional properties of nanomaterials that rely on solid and liquid diffusion processes. The materials covered range from metallic nanofilms to ceramic nanoparticles and fillers, from inorganic nanocomposites to carbon nanotubes, from nanostructured powders to nano-based sensors and nanofluids. We are grateful to the authors for their timely submission of manuscripts and to the referees for their efforts in efficiently reviewing the manuscripts.

Andreas Öchsner

Irina V. Belova

Graeme E. Murch

January 2011