Editorial

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Biographical notes: Abdolreza Simchi graduated in Materials Science and Engineering at the Sharif University of Technology in 1999 and in 2001 received his PhD. After two years postdoctoral research at the Fraunhofer Institute for Manufacturing and Advanced Materials (IFAM) in Bremen, Germany, he started his academic career at the Sharif University of Technology in 2001, where he became Associate Professor in 2004 and full Professor in 2009. He actively contributed in establishment of the Institute for Nanoscience and Nanotechnology at Sharif University of Technology where he is currently a member of the research board. He is also the Chair of Research Center for Nanostructured and Advanced Materials at the Department of Materials Science and Engineering at Sharif University of Technology. His activities are in the broad area of nanostructured materials, metal matrix nanocomposites, nanoparticles, nanoceramics, and mechanical properties of functional structures.

From the early years of the new millennium, nanotechnology gained fame as the basic and key technology of the future as well as the stimulator of a new wave of innovative technologies in the world gatherings. Many countries have emphasised the socio-economical impact of this fast-growing technology thus considered heavily investment on their infrastructure to boost research and development. Nanotechnology with its sweeping nature and close interactions with basic sciences requires a long-term and multi-part planning. In the Islamic Republic of Iran, the necessity of having a long-term planning for development of nanotechnology has well been emphasised by the government in 2003, leading to establishment of The Special Office of Nanotechnology Development in Tehran. After execution of numerous promotional programs through the world and taking into account the priorities and potential of the country, formulation of developing strategy has been documented. In order to lay the groundwork for execution of the long-term program, the Office started supporting human-resources development and infrastructure networking of laboratories through short-term funding. In 2005, the government cabinet officially approved the strategy based on 'b' clause of paper 43 of law of the Fourth Economic, Social and Cultural Development Plan of the Islamic Republic of Iran, establishing the vision, mission, major goals, policies, strategies, executive programs and structure of The Iranian Nanotechnology Initiative Council (www.nano.ir). The Council has planned ten-year development programme

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including three horizons of two year (short-term), five year (middle-term) and ten year (long-term). After successful passing the short-term period, the fruit of collaboration and directing has appeared. Many universities and research centres in Iran are now involved in nanotechnology research and education. Major universities now offer MS and PhD degrees in nanoscience and nanotechnology. Over 80 public and private universities distributed in 13 provinces of the country (out of 24) are actively contributing in nanotechnology research. Broad range of areas is covered but the major part is given to synthesis and characterisation of nanostructures, modelling and simulation, and biotechnology application. While in 2004, I.R. Iran was ranked in the position of #45 amongst the active countries in nanotechnology in the world, it gained the position of #25 based on publication in accredited journals and patents in 2008. The country is now ranked as #1 in nanotechnology among 62 Islamic countries. Estimation based on the growth rate reveals a very bright future for the country, i.e., achieving the position of #16 in the world at the end of 2009 and putting the name of the country amongst the top six nations in Asia. In addition to academic research, some private companies have been established in the last four years to find and expand the market. It is difficult to quantify the economical impact of nanotechnology in the country, but 15 M\$ investment by the government within this and next year should create a momentum to push the technology forward. The number of national and international conferences and exhibitions held in the country with an average participation rate of 200-300 persons clearly shows the interest in nanotechnology in I.R. Iran and its future development.

The aim of this Special Issue of *International Journal of Nanotechnology* is to present the current state-of the-art in the area of synthesis and characterisation of *nanostructured materials* in the Islamic Republic of Iran. It also attempts to provide a forum for fundamental understanding of the atomic and molecular infrastructure of materials in order to develop next generation of nanomaterials and related manufacturing processes. The field of nanostructures already has many researchers and entrepreneurs engaging in cutting-edge efforts, with the field expected to grow exponentially over the next few decades. Major advances will be achieved when the novel behaviour, in particular the quantum mechanical behaviour, which nanoscale structures possess, can be controlled and harnessed. A massive effort is still needed in order to control the fabrication of nanostructured materials and exploit processes based on quantum mechanical laws. This Special Issue pulls together some of the more recent research in this area and aids for those interested in a responsible approach to nanostructures while in pursuit of further advances in nanotechnology.

The papers presented in this issue are based on oral presentations made during the *Second International Conference on Nanostructures* held 11–14 March 2008 at the Kish University (Kish Island, I.R. Iran) with the scientific and technical support of the Institute for Nanoscience and Nanotechnology of the Sharif University of Technology (Tehran, I.R. Iran). At the Conference, a large number of keynote lectures (14), invited talks (4), technical sessions (12), oral presentations (48) and posters (144) were provided on a wide range of topics such as *Nanobiotechnology, Nanoparticles and Quantum Dots, Nanotubes and Nanocomputation and Modeling*. Although the conference proceedings contain all the presentations (A. Simchi, Ed.; *Proceedings of the Second Conference on Nanostructures, Kish university Publication; 2008*) the papers included

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in this Special Issue are specially extended versions of the conference presentations selected to represent advances in nanostructured materials and are expected to enlighten readers of the *International Journal of Nanotechnology*. We are grateful to authors who contributed to this Special Issue.