

Editorial

Approximately 30 years ago French Chemists used the term Solvothermal to describe the chemical reactions under supercritical conditions which are contrasting to the term hydrothermal where water and/or aqueous solutions are presented. In solvothermal non-aqueous or supercritical solutions are used as the solvent medium. Further, the technique was initially used to synthesize and stabilize certain metastable phases and compounds, and to carry out some difficult chemical reactions under special environment. But today it has grown as an independent branch of science. In the last one decade the Solvothermal technology has brought in a revolution in material processing dealing with some of the most complicated issues of science and technology. Every two years International Conference on Solvothermal reactions is being organized in various parts of globe like Japan, USA, France, China, and India. The solvothermal technology is greatly contributing to the progress of material research and sustainable development of man kind. The Sixth International Conference on Solvothermal Reactions held in Mysore, India during 24–27 August 2004 covers the following topics such as Solution Chemistry, Thermodynamics, Phase diagrams, Modeling, Kinetics and Diagnostics method, Material Synthesis and Processing of Inorganic, Organic, Organometallic, Metallo-organic, Crystal growth of Bulk, Single and Nanocrystals and also Thin films, Chemical Engineering, Waste treatment, Effluent treatment, Alteration, Novel Materials, Nanomaterials, Nanotechnology, Supercritical fluids, Metallurgy, Extraction and Separation, Technologically Important Materials, Geothermal reactors, Geological processes and Systems, Experimental Mineralogy and Petrology. We had received 157 research articles for this special edition of Journal of Materials Science. All the articles were subjected to peer reviewing by the senior experts from all over the world. Based on the out come of peer reviewing the editors have selected the 52 best research articles for inclusion in this special edition. Here, we wish to make a special mention to Prof. C.N.R. Rao, *FRS*, for inaugurating the conference and also writing foreword for this special edition.

Foreword

Solvothermal technology is emerging as an important tool for materials processing. Though the term solvothermal was introduced in 1970s, it has gained its momentum in the last one decade owing to its advantages in the preparation/stabilization of certain complex structures, recycling, waste treatment, alteration, novel materials synthesis, nanotechnology, supercritical fluid systems and so on. Both editors have good international reputation in solvothermal and hydrothermal technologies. They have jointly authored a popular book entitled “Handbook of Hydrothermal Technology—A Technology for Crystal Growth and Materials Processing,” Here again in this special edition of Journal of Materials Science, they have carefully selected very interesting research articles written by well-known authors from all over the world. The articles covered in this special edition deal with almost every aspect of solvothermal processing in modern technology. The readers are cordially invited to explore and access the crucial role and significance of this new tool of materials processing.

Prof. C.N.R. Rao, *FRS*
President, JNCASR
Bangalore, India

This special issue covers the various aspects of Solvothermal and its closely related Hydrothermal technologies dealing with the following topics such as Supercritical technology, Novel Material synthesis, Nanotechnology, Recycling, Green technology, Nanocomposites, Crystal Growth, Phase equilibria studies, Modeling and also some important reviews written by most senior experts in this area making a most comprehensive edition on Solvothermal Technology. So far there is no book dedicated exclusively on Solvothermal Processing of Materials and also there is no Journal covering exclusively on this important material processing tool. We sincerely hope that this special edition will be a highly valuable one for the Materials Science community on the whole. We acknowledge the help extended by Prof. J. Shashidhara Prasad, President, University of Mysore, Mysore, for his constant encouragement in our efforts and all our senior experts from the solvothermal community in reviewing the articles submitted to this special edition. Also our special thanks to some of our Japanese colleagues like Prof. Tadafumi Adschiri, Prof. K. Yanagisawa, Prof. T. Sato and others for their active support in all our endeavors. Lastly thanks to our colleagues Dr. B. Basavalingu, Dr. B.V. Suresh Kumar, Dr. K.M. Lokanatha Rai, Dr. S. Ananda and our research students like Mr. P. Madhusudhana, Mr. C.K. Chandrashekar, Mr. H.N. Girish, Mr. A.S. Dayananda, Mrs. M.K. Sunitha,

A NOVEL METHOD OF ADVANCED MATERIALS PROCESSING

Mrs. P.G. Smitha and our Secretaries Ms.M.K.Padmashree and Ms. Hiroko Yoshioka for their support in compiling this special edition. Finally our special thanks to Ms. Angela DePina and Dr. Helen M. Chan, Member, Editorial Board, Journal of Materials Science, Springer, USA for their constant cooperation in bringing out this special edition.

Prof. K. Byrappa (Editor)

India

Prof. M. Yoshimura (Editor)

Japan