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Professor C.N.R. Rao

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FOREWORD

Professor Chintamani Nagesa Ramachandra Rao (C.N.R. Rao) is a towering personality in Indian science in the post-Independence era, whose immense contributions span over five decades covering several facets of Chemical Sciences. Professor Rao's prolific research work delineated in more than 1200 publications and 36 books, has made an impact on a wide range of topics that include chemical spectroscopy, molecular structure, various aspects of the solid state — synthesis, structure and properties. To him, it concerns very little whether the system under investigation is organic, inorganic or a composite material, but it is the property or the phenomenon that interests him always. For example, he has worked with equal felicity on rutile-anatase, metal-insulator, plastic-crystalline, para-ferri-ferro magnetic transitions as well as on charge-ordering, phase separation, donor-acceptor complexes, superconductors, and last but not least, the fascinating field of fullerenes and nanomaterials.

Solid State and Materials Chemistry has been very close to his heart during the last two decades, where he has made significant contributions to the synthesis of novel materials, developing new routes to synthesis, copper oxide based superconductors, manganese oxide based magnetoresistive materials, among others. Particularly noteworthy is his unique work on porous and open-framework solids, where he has not only assembled a variety of crystalline architectures but also unravelled the fundamental principles governing the formation of structures of different dimensionalities. A natural extension has been into the fascinating world of the supramolecular chemistry, where for example, he has synthesized a novel organic zeolite and a hybrid solid containing layers of silver sheets separated by an organic spacer. He has established a world class research laboratory for the synthesis and investigation of nanomaterials in various forms of aggregation including clusters, tubes and wires; a special Y-junction nanotube showing rectification, doped gallium nitride nanowires and several nanoobjects based on transition metal chalcogenides are some of the important materials created in his laboratory.

It is with a profound sense of respect and gratitude to Professor C.N.R. Rao that we present to the scientific community, this monograph containing a selected collection of seventy of his research publications spanning the last one decade (1994–2003). It has not been an easy task to make this selection, especially because another set of equally important papers could have been easily collected from his 350 publications during

this period. In making this selection, an effort has been made to bring out the flavour of Professor Rao's contribution to the entire gamut of Chemistry and Physics of Materials, in general. The collection of papers under different sections is preceded by Professor Rao's comments which embellish the contents with a personal touch. It must be added that such an elegant publication would not have been possible without the support from the Third World Academy of Sciences, Trieste, and the cooperation of the Publisher, World Scientific Publishing Co., Singapore especially, Dr. K.K. Phua, and Ms. Lakshmi Narayanan.

We do believe that the present volume will not only be treasured by his friends, close associates and admirers but also be cherished by young practitioners. For the two of us, it has indeed been a great privilege and honour to serve as Editors of this special monograph felicitating Professor C.N.R. Rao on his 70th birthday.

*May God Almighty bless him with many more
years of research activity and highest scientific
laurels!*

G.U. Kulkarni

J. Gopalakrishnan

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