Preface

This Special Topic Volume is a result from the contribution of forty-one experts from the international scientific community in the respective field of research. It thoroughly covers recent work done in the area of photocatalysis. In recent year a boosting interest in the exploration of renewable energy sources and environmental abatement attracted the promises of photocatalysis particularly in hydrogen production by water splitting, storage of solar energy in sustainable chemical fuels, decomposition and removal of environmental pollutants and disinfection of water. Current environmental concern promises a bright future for this technology, particularly applications to improving the quality of water and of indoor and outdoor air. In addition to environmental remediation, promising results are being obtained in energy-oriented applications of photocatalysis such as production of hydrogen by water splitting or by the reduction of carbon dioxide. The selected article on the CO_2 reduction and utilization, hydrogen production, water purification using different photocatalytic materials and films are considered for publication in this special topic volume. This volume provides the latest and in-depth coverage to photocatalytic materials and surfaces including their various applications for environmental and energy applications.

This volume is indeed the result of remarkable cooperation of many distinguished experts, who came together to contribute their research work and comprehensive, in-depth and up to date review chapters. I am very much thankful to all contributing authors who, in spite of their busy life in research and teaching, willingly accepted the call to contribute and sent their manuscript in time. I would also like to express my gratitude to all the publishers and authors and others for granting us the copyright permissions to use their illustrations. Although sincere efforts were made to obtain the copyright permissions from the respective owners to include the citation with the reproduced materials, I would like to offer my honest apologies to any copyright holder if unknowingly, their right is being infringed.

This volume contains fifteen state-of-the-art research articles and reviews from the international scientific community in the respective field of research. It thoroughly covers photocatalytic reduction and conversion to value added product of carbon dioxide, photocatalytic and photo-electrochemical hydrogen production, and water purification. It also covers synthesis and characterization of various photocatalysts based on magnetically separable ferrite and CdO-Fe2O3 nanocomposites, corbonate modified TiO_2, bismuth subcarbonate, and Bi-based oxyhalides. Also few articles are based on the preparation and characterization of semiconductor thin films on various substrates for removal of toxic pollutant and hydrogen production.

I would like to take this opportunity to express my sincere gratitude to Dr. P. K. Ghosh (Director, Central Salt & Marine Chemicals Research Institute-CSIR, Bhavnagar). My special thanks Dr. H.C. Bajaj (Senior Principle Scientist, CSMCRI, Bhavnagar). My thanks to Mr. Sivakumar Thillai and Mr. Kalithasan Natarajan, without their continuous encouragement and association with me during this Special Topic Volume would have not been brought into its final form. I would like to acknowledge the sincere efforts of Mr. Thomas Wohlbier of TTP publishing Authority, in evolving this Special Topic Volume in to its final shape. Last but not the least I am highly appreciative of the support of my all family members.

Rajesh J. Tayade
Discipline of Inorganic Materials & Catalysis,
Central Salt & Marine Chemicals Research Institute,
Bhavnagar-364 002 (Gujarat)
India