

Photochemical Conversion and Storage of Solar Energy

Foreword

The perennial energy source of the sun is responsible for entire life processes on earth. Of the total radiant energy from the sun reaching the earth's surface, about 14.5% is possibly absorbed by the land's surface. Solar energy is vital for sustaining plant, animal and other forms of life on earth. Efficient ways utilized in converting solar energy to stable forms of chemical energy is an important pursuit towards a sustainable environment.

Artificial photosynthesis is a process of duplicating the plant's function of converting solar energy to useful products. This requires a detailed knowledge of molecular components and their organization that are responsible for efficient quantum conversion of solar energy. A series of international meetings of scientists held once in two years in different parts of the world have been successful in channelizing thoughts and experiments to harness and utilize solar energy in a purposeful manner for the benefit of mankind.

The organization of this meeting in India, had a special feature in that eminent scientists all over the world congregated and discussed various issues that are of great source of knowledge to the scientists working in the country. The venue of the meeting was the Indian Institute of Science, Bangalore, and many scientists participated in the week-long meeting (July 28–August 2, 1996). The structure of the meeting had plenary lectures covering a wide spectrum of research interests. It is a pleasure to bring forth this edition containing thirteen papers though originally scheduled for twentyone presentations. This issue has a special feature, in that the formatting of references are different from other issues of this journal.

A brief account of the workshops held during the meeting would be useful to the reader. There were three concurrent poster sessions in which many scientists displayed their current research findings. The workshops on Photoelectrochemistry and solar fuel cells, Photocatalysis in homogeneous and heterogeneous systems and environmental aspects of photocatalytic systems, and Electron transfer in photosynthesis and biomimetic model compounds and magnetic resonance studies; focussed attention on some of the newer findings and set a new trend of research activities in various fields. The important feature of these workshops was the deliberation of interesting results reported by many scientists through short presentations. There was a special workshop organized to bring an update on solely Indian efforts in the area of solar energy conversion and utilization. This workshop—Developments in solar energy utilization: Indian scene—was of particular interest to scientists both in India and other countries as well. This formed a forum for experience-sharing among scientists from different countries about their research efforts. The presentations made in this area were on Solar-thermal power generation, Solar process heat applications in India, Current status and future prospects and Solar cooling technology. One of the presentations is included here in this issue.

This meeting witnessed significant progress in basic and practical aspects such as new designs effecting long-lived charge-separation in homogeneous and heterogeneous systems, the photoelectrochemical catalysis at semiconductor/solution interfaces, the photodegradation of contaminants and others. It is clear that appropriate strategy has to be developed, to spend the talent and resources available, on basic scientific problems in the expanding areas of applications such as sensor, imaging devices, memory devices, nanotechnology and others.

We would like to express our sincere gratitude to the speakers of the plenary and invited lectures who contributed to these advances, in particular to those presented in this issue. We would also take this opportunity to thank all the participants and the sponsors of this conference. This conference could not have taken place without the support of several agencies. The consistent support of the Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore, and in particular Professor CNR Rao, President of the Centre are much appreciated. The home Institute, the Indian Institute of Science, Bangalore and the National Advisory and Local Organizing Committees have been a constant source of help and encouragement. We wish to acknowledge the generous support from the Department of Science and Technology, New Delhi, Council of Scientific and Industrial Research, New Delhi, Department of Atomic Energy, Trombay, Bombay, Indian Space Research Organization, Bangalore, Indian National Science Academy, New Delhi, and others. It remains a pleasure to thank the Indian Academy of Sciences, Bangalore for bringing out this issue in one of their journals and for the untiring help of its editorial staff.

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