

# **Photoelectrochemistry**

## Principles and Practices



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## Preface

Over the last four or five decades, the subject of photo-electro-chemistry and photo-catalysis has been receiving considerable attention both academically and also for scientific research and practice. Research in this area is exploding in terms of number of publications. This subject has also been realized as essential for development of effective energy conversion devices and sustainability of life on earth. The authors have been considering formulating a monograph on this subject for a number of years since young researchers who are initiating research in this field find it hard to assimilate all the available knowledge and information in a short period. It has also been reflected and realized during the various special courses that the National Centre for Catalysis Research (NCCR) at Indian Institute of Technology, Madras has conducted on this topic. However, the hesitation to bring out a monograph lingered on due to the fact that every week, the literature in this field is expanding. Hence there was a fear that the coverage may look outdated when the monograph appears in print. This fear being fully present even now, the authors took the bold step of providing a level of knowledge with the fear that the coverage can not be comprehensive nor will be most upto date.

Having felt the need from various points of view, the authors considered the contents of the monograph and decided to restrict to some specific aspects on this branch of science for obvious reasons like affordability, available time for assimilating the knowledge and other related issues. Hence it should not be considered that this is a comprehensive monograph on this subject but has the bias of the authors and also other considerations mentioned above. It is also gratifying to note that many authoritative reviews are appearing on various aspects of this subject from time to time on regular basis and there are other authoritative sources of information on this subject and the readers should peruse these reviews for their knowledge assimilation. At most this monograph can be an introduction to this wealth of knowledge made available on this subject from time to time.

The authors felt that research in this field will have far reaching consequences for life sustainability on earth and hence introduction of these

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subjects in the educational curriculum may become possible only when a suitable and appropriately tailored document is available as a reading source material. NCCR has introduced one such course in their Master's curriculum and attempted to experiment with the contents of this proposed monograph as a viable text. It is hoped that this compilation will also serve the purpose of an available text book and the educational curricula of the various institutions may introduce this subject at appropriate levels. It is fully realized that this compilation does not cover all aspects of this branch of science and it is hoped that it will kindle interest in the minds of the readers to dwell deep in this subject and experience the thrill of being in frontier in Science.

In a subject like this, there can be many gaps and limitations and the authors will be grateful if these aspects are brought to their attention so that these left out aspects can be included in subsequent attempts if there were to be some.

The authors wish to thank their learned colleagues and research scholars in their respective institutions who have consistently contributed to the formulation and production this monograph. The inquisitive academic atmosphere provided by them has been one of the motivating factors and it is our duty to thank them for the same. We do hope that these colleagues will experiment introducing this course. One of the authors experimented this material in a course on Photo-catalysis for M Tech students in Indian Institute of technology, Madras. They also wish to thank the **Department of Science and Technology**, Government of India for not only supporting the National Centre for Catalysis Research but also encouraged conducting these short term courses at **NCCR**.

Finally, the authors will be grateful for pointing out any shortcomings in this compilation.

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