

## Preface

Today mankind is confronted with energy and environmental problems. The ultimate solution to the energy problem is the effective use of solar energy. With respect to the environmental problem, one solution is the development of reaction processes that are free from unwanted by-products. Photoreaction control, once developed, is expected to be a key technology in solving both these problems. Photoreaction control is, in our definition, a technology to control reactions at the atomic and molecular levels by using photons. We expect that it will enable us to develop efficient artificial photosynthesis, highly selective synthesis of materials, and material processing on the nano-scale.

It should also be recognized that in this new information age, the needs for high-speed and high capacity information processing and transmission are intensified. Optical information processing is expected to be a means to solve this problem, and the development of photofunctional materials is vital for the realization of optical information processing.

The "Photoreaction Control and Photofunctional Materials" project was started by the National Institute of Materials and Chemical Research (NIMC) in 1997 with the aim described above. It is now being continued by the National Institute of Advanced Industrial Science and Technology (AIST) which was established in April this year by uniting NIMC with other institutes. The Fourth NIMC International Symposium on Photoreaction Control and Photofunctional Materials was held on 14–16 March 2001 in Tsukuba, Japan, as one of the activities associated with this project.

The purpose of this Symposium was to provide a forum for scientists from Japan and abroad to present their work in the field of photoreaction control and photofunctional materials, and to facilitate discussions and the exchange of opinions among them. The Symposium had four sessions: Photoreaction Mechanism, Light Energy Conversion, Laser-induced Reactions, and Photofunctional Materials. Each session consisted of 6–7 lectures. The poster sessions were held separately. A total of more than 280 people attended the Symposium and about 110 papers were presented. This special issue collects most of the papers presented as lectures and some of those presented as posters. Some of the papers presented as lectures were excluded on the basis of the policy of the Journal of Photochemistry and Photobiology because they could be classified as review articles rather than original papers.

We hope that this special issue stimulates further studies in the field of photoreaction control and photofunctional materials.

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