



Preface

Today mankind is confronted with energy and environmental problems. The ultimate solution to the energy problem is the effective use of solar energy. On the other hand, one solution to the environmental problem is the development of reaction processes that are free from unwanted by-products. Photoreaction control is expected to be a key technology to develop in solving both of these problems. Photoreaction control is, in our definition, a technology to control reactions at 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 nano-scales.

It should also be recognized that with the information-intensive society close at hand, the needs for high-speed and high-capacity information processing and transmission are intensified. Optical information processing is expected as a means to solve this problem, and the development of photofunctional materials is vital to the realization of optical information processing.

With the background described above the "Photoreaction Control and Photofunctional Materials" project was started by one of the predecessors of the National Institute of Advanced Industrial Science and Technology (AIST), Japan, and has been continued by AIST. The Fifth AIST International Symposium on Photoreaction Control and Photofunctional Materials was held in Tsukuba, Japan during March 18–20, 2002 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 topics covered in the symposium include Quantum Control of Chemical Reactions by Coherent or Intense Lasers, Photoinduced Electron Transfer Reactions, Single Molecule Spectroscopy and Other New Spectroscopic Techniques, Artificial Photosynthesis, Dye-Sensitized Solar Cells, Photocatalysis, Laser Processing, Photoreactive Materials, and Photonic Materials. Twenty three lectures were given in 11 sessions. 105 posters were presented in two poster sessions. A total of 252 people attended the symposium. This special issue collects most of the papers presented as lectures and some of those presented as posters.

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

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