OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

This document has been produced without formal United Nations editing. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations Industrial Development Organization (UNIDO) concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or its economic system or degree of development. Designations such as "developed", "industrialized" and "developing" are intended for statistical convenience and do not necessarily express a judgment about the stage reached by a particular country or area in the development process. Mention of firm names or commercial products does not constitute an endorsement by UNIDO.

FAIR USE POLICY

Any part of this publication may be quoted and referenced for educational and research purposes without additional permission from UNIDO. However, those who make use of quoting and referencing this publication are requested to follow the Fair Use Policy of giving due credit to UNIDO.

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

20252

6 A (NS)

REPORT

CONTRACT NO. 93/039

between the

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO)

located at

Vienna International Centre, P.O. Box 300, A-1400 Vienna, Austria

Telephone : 21131, Telex : 131218 pac a Fax: 230-8272

and

AIN SHAMS UNIVERSITY

located at

Abbassia, Cairo, Egypt

for

The Execution of Services Related to the Second International Conference on Solar Energy Storage and Applied Photochemistry, 6 - 11 January 1993, Cairo, Egypt

---

Project No.: US/GLO/89/104

Purchase Order No.: 15-3-2039H

REPORT

2nd International Conference on

SOLAR ENERGY STORAGE & APPLIED PHOTOCHEMISTRY

Under The Auspices of

PRESIDENT

MOHAMED HOSNY MUBARAK

HONORARY PRESIDENTS OF THE CONFERENCE

Professor A.M. Abdel-Hafez

President of Ain Shams University (ASU)

Professor M. A. Bassiuoni

Dean of The Faculty of Science

Organised by:

Chemistry Department

Chairmen

Abdel-Mottaleb, M.S.A. (ASU)

El-Sayed, M. A. (UCLA)

CAIRO, EGYPT

6-11 January 1993

The organizers thank deeply the following organizations
for their generous financial
and moral support

SPONSORS

Ministries of Education and
Scientific Research

Ministry of Petroleum

Ministry of International Cooperation

Supreme Council of Universities (SCU)

Egyptian Academy of Sciences and Technology

Cairo Governorate

International Centre for Science and High technology
[(ICS/IIC/ICTP)-Trieste, Italy]

Naval Research Office [EUROPEAN office, UK]
US Navy

REPORT

SECOND INTERNATIONAL CONFERENCE ON SOLAR ENERGY STORAGE AND APPLIED PHOTO-CHEMISTRY, CAIRO, EGYPT, 6 - 11th January 1993

Some 3300 years ago, worship of the Sun god "Aton" was established in Egypt by Akhenaton. The sun thus became recognised as a vital source of life and has played a central role in both Egyptian and Middle-Eastern cultures and mythologies. Contemporary European culture is widely regarded as having its origins in the Middle East and so international scientific exchanges between this region and the rest of the world are a natural development. It was, therefore, most appropriate that the International Conference on Solar Energy Storage and Applied Photochemistry should be held, for the second time, in Egypt and particularly in the "City of the Sun", Heliopolis, in the suburbs of Cairo.

The development and application of chemical reactions occurs across and between scientific disciplines and photoinduced chemical processes are no exception. Thus conferences concerned with photochemistry attract a range of contributions from several scientific disciplines; the common concerns are, however, to develop a use of, or gain a better understanding of photochemically induced molecular changes. The breadth of interests represented in the Egyptian Conference was considerable, reflecting the fact that solar energy storage and its conversion have many facets including photovoltaic processes, semiconductor driven chemical devices, through to the synthesis of compounds using near ultraviolet or visible radiation.

The Conference attracted some one hundred colleagues from twenty four countries and well over one hundred Egyptian scientists predominantly from Cairo universities and government institutions. Delegates were warmly welcomed to Egypt and to the Conference on the first morning by dignitaries from the Egyptian Ministry of Education and the Ain Shams University. Professor El-Sayed also expressed his pleasure at seeing so many scientists from different disciplines and different parts of the world who were dedicated to the task of utilising solar energy in one way or another.

The scientific programme reflected the many fields of wide current interest in photochemistry and photophysics and had clearly been compiled with considerable care and thought by Prof. M.S.A. Abdel-Mottaleb from Ain Shams University, Cairo,

and the members of his international scientific committee. It was also appropriate that eminent Egyptian scientists now working in North America presented their recent work. The first talk by Professor J.M. Lehn (Paris) on "Light-triggered molecular and supramolecular devices" set the tone for a conference of high scientific and intellectual content and this was consistently maintained throughout the meeting. Indeed, the last lecture on "Strategies for solar fuel generation" from Professor H. Tributsch (Berlin) was one of the many highlights of the Conference.

The other lecturers and topics were (in chronological order): M. Masuhara (Kyoto): Photochemistry in small micrometer domains; U.P. Wild (Zurich): From single molecule spectroscopy to molecular computers; A.H. Zewail (Pasadena): Ultrafast lasers in chemistry and physics; A. Albini (Torino): Synthetic Chemistry via radicals generated by photoinduced electron transfer; E. Greenbaum (Oak Ridge): Photobiotechnology: Application of photosynthesis to the production of renewable fuels and chemicals; N. Getoff (Vienna): Purification of drinking water by irradiation; T. Azumi (Sendai): Studies of photochemical reactions by CIDNP-detected ESR-spectroscopy, T. Gillbro (Umea): Photophysics of carotenoids and their role in photosynthesis; A. Holzwarth (Mülheim): Electron transfer processes in isolated photosynthetic reaction centers; M.G. Kuzmin (Moscow): Exciplex mechanism of the fluorescence quenching in polar media; H. Shizuka (Gunma): The hydrogen atom transfer reaction from triplet aromatic compounds to benzophenone via a triplet exciplex; J.C. André (Nancy): What's new in stereophotolithography?; J. Guillet (Toronto): Solar synthesis of pharmaceutical and other valuable chemical intermediates; L.A. Linden (Stockholm): Applied photochemistry in dental science; M.A. El-Sayed (Los Angeles): The proton pump system of bacteriorhodopsin photosynthesis; N. Rahman (Trieste): Dynamics of triatomic molecules); P. Kamat (Notre Dame): Photoinduced CT processes in colloidal semiconductor systems; K. Kemnitz (Berlin): Primary photophysical processes in dye aggregates; A.S. Abd-el-Aziz (Winnipeg): Photochemical liberation of some important organic compounds from their iron complexes; M. Hoffman (Boston): Photoinduced charge separation by Ru(II)-photosensitizers; S. Yanagida (Osaka): Efficient photoreduction of carbon dioxide catalyzed by ZnS or CdS microcrystallites; V. Balzani (Bologna): Supramolecular photochemistry and photophysics; M. Demuth (Mülheim): The use of concentrated solar radiation for photochemical syntheses; N. Toshima (Tokyo): Gold-platinum bimetallic cluster catalyst for visible light induced hydrogen production from water; Ch. Pac (Chiba): Photochemistry and photophysics of Re(I) bipyridine complexes associated with carbon dioxide photoreduction; H. Dürr (Saarbrücken): Light induced electron transfer in simple and supramolecular Ru-polypyridine complexes; L. De Cola (Bologna): Dinuclear complexes of Ru and Os containing a rigid bridging ligand; M. Etman (Meudon): Cation effect on the anodic

dissolution of p-silicon; L. El-Nadi (Cairo): Prospectives of energy conversion through directly pumped solar lasers; A. Mele (Rome): Laser ablation of inorganic and organic materials; W.P. Neumann (Dortmund): Applied photochemistry for organic synthesis by means of bistannane reagents; R. Lapouyade (Bordeaux): Photocyclization of arylethylenes - mechanism and scope of the reaction; D.Oelkrug (Tübingen): Mobility of photoexcited molecules on surfaces; T. Nakayama (Kyoto): Amine assisted photochemical dehalogenation of haloanthracenes and their triplet formation; S. Miki (Kyoto): Photochemical reactions of [6]-1,4-cyclophaneanthraquinone; J. Kossanyi (Thiais): Influence of the geometry on the emission of N-substituted naphthalimides; D. Döpp (Duisburg): Light induced additions of captodative alkenes; J.C. Scaiano (Ottawa): Connecting the free radical, carbene and carbocation manifolds through electron and proton transfer reactions; F. Wilkinson (Loughborough): The role of charge transfer interactions in the mechanism of quenching of triplet states by molecular oxygen - nanosecond and picosecond laser flsh photolysis studies; F.C. De Schryver (Leuven): Photophysics of pyrene substituted oligosilanes; U. Mazzucato (Perugia): Phctoisomerism and rotamerism of 1,2-diarylethylenes - effect of charge transfer interactions; A.J. Nozik (Golden): Quantization effects on hot electron relaxation vs. electron transfer in quantum films and quantum dots; S. Farid (Rochester): Radiative and non-radiative electron transfer; G.B. Schuster (Urbana): Photoinitiated electron transfer reactions: Reactors with molecular scale dimensions control rate and efficiency; D.G. Whitten (Rochester): Photoinduced electron transfer reactions in Langmuir-Blodgett assemblies and phospholipid bilayers; T. Ohno (Osaka): Photoinduced electron transfer in bimetalated compounds; L. Hammerström (Uppsala): Electron transfer through vesicle membranes; R. Memming (Hannover): Kinetics of charge transfer reactions in photoelectrochemical cells. - A further fourty one presentations were made in the two poster sessions.

In his closing remarks, Professor El-Sayed reflected the feelings of the participants by commenting that the range of topics presented and discussed at the Conference, and the interests and disciplines of the delegates were the broadest at a photochemical symposium in his experience. He gave a rallying call to all the participants to pursue with vigour all aspects of photochemistry and solar energy conversion, particularly in view of the rapid depletion of fossil fuels and the detrimental effects on the environment of these energy sources.

The number of scientific conferences which one would wish to attend continues to increase, and so the special merits of meetings like this conference should be stressed. First, scientists were attracted from all over the world to a country not only with a fascinating history but also one which deserves respect for the enormous efforts being made to educate its people. Secondly, it allowed the

many young Egyptian scientists present to make contact with international experts and thereby to establish new national photochemical activities. Thirdly, the friendliness of the scientific gathering fostered new, and revitalised established, cooperations on the person-to-person level.

Finally, it is a great pleasure to acknowledge the outstanding efforts of Sabry Abdel-Mottaleb which made the conference a tremendous success. The gratitude of all the participants goes to him, to his numerous helpers, and to the sponsors of the conference. Lasting impressions of the delegates will no doubt include the high intellectual level of the science, the warmth and outstanding hospitality of the Egyptian people, and the delightful folk dancing at the farewell banquet.

Andrew Gilbert
Dept. of Chemistry, The University
Whiteknights
Reading, U.K.

Dietrich Döpp
Organische Chemie
Universität Duisburg
Duisburg, Germany

Abdel Mottaleb M.S.A.