

# Proceedings

---

## 12<sup>TH</sup> INTERNATIONAL SYMPOSIUM ON **Plasma Chemistry**

### Volume I

August 21-25, 1995

Edited by  
J.V. Heberlein, D.W. Ernie, J.T. Roberts

---

UNIVERSITY OF MINNESOTA  
Minneapolis, Minnesota, USA

---

## PREFACE

The 12th International Symposium on Plasma Chemistry has continued the tradition established by previous Symposia of providing a forum in which all areas of plasma chemistry are represented, and in which the range from fundamental aspects to applications is covered. These proceedings contain the text of the papers contributed to the conference, and abstracts of the invited presentations. The complete text of the invited papers will be published in a special issue of *Pure and Applied Chemistry*. The proceedings also contain the abstracts of a special session in honor of Professor Emil Pfender on the occasion of his 70th birthday. These papers will be published in a special issue of *Plasma Chemistry and Plasma Processing*.

These proceedings are organized thematically with sessions grouped by topic, e.g., the papers in all sessions related to plasma polymerization and polymer treatment appear in sequence. Papers within a session are listed in order of presentation. The topical groupings appear in order of their listing in the program. This order of presentation has been judged the most useful, since the traditional classification into thermal plasmas and low pressure non-equilibrium plasmas is becoming less and less adequate. The continued growth of research and applications in high pressure non-equilibrium discharges, the use of various plasma sources for the growth of diamond films, and the large number of contributions dealing with environmental applications of plasma chemistry utilizing different types of plasmas are testimony to this fact.

In closing I would like to express regret that a number of interesting papers submitted to the conference could not be included in the proceedings because the authors were unable to attend. Overall, the presentations at this conference reflect the ongoing growth in research efforts in plasma chemistry, with the continued emergence of new applications.

Joachim Heberlein

Minneapolis, July 1995

---

# ORGANIZING COMMITTEES

## **International Committee:**

Prof. J. Heberlein  
Chair, USA  
Dr. A. Garscadden  
USA  
Prof. J.E. Harry  
U.K.  
Prof. Y. Horiike  
Japan  
Dr. H. Lowke  
Australia  
Prof. G. Pietsch  
Germany  
Dr. R. Seeböck  
Germany  
Prof. A. Vardelle  
France  
Prof. G. Vinogradov  
Japan

## **Local Committee (University of Minnesota):**

Prof. J. Heberlein, Chair  
Prof. D. Ernie  
Prof. S. Girshick  
Prof. H. Oskam  
Prof. E. Pfender  
Prof. J. Roberts  
Prof. J. L. Shohet (Univ. of Wisconsin)  
Ms. L. Graven (conference office)  
Ms. C. Ploetz (conference office)

## **Subcommittee on Plasma Chemistry**

Prof. D. Schram, Chair  
Netherlands  
Prof. T. Yoshida, Vice-Chair  
Japan  
Prof. H. Biederman  
Czech Republic  
Prof. P. Fauchais  
France  
Dr. R. Gottscho  
USA  
Prof. J.E. Harry  
UK  
Prof. M. Moisan  
Canada  
Prof. S. Morita  
Japan  
Prof. R. Munz  
Canada  
Prof. O. Solonenko  
Russia  
Prof. K. Wiesemann  
Germany  
Prof. C.-K. Wu  
PRC