

This article was downloaded by:

On: 21 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## International Reviews in Physical Chemistry

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713724383>

### Book Review

A. G. Maddock<sup>a</sup>

<sup>a</sup> University Chemical Laboratory, Cambridge

**To cite this Article** Maddock, A. G.(1987) 'Book Review', International Reviews in Physical Chemistry, 6: 3, 269

**To link to this Article:** DOI: 10.1080/01442358709353408

**URL:** <http://dx.doi.org/10.1080/01442358709353408>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## Book review

*Positron Annihilation: Proceedings of the Seventh International Conference on Positron Annihilation, New Delhi, India, January 1985.* Edited by P. C. JAIN, R. M. SINGRU and K. P. GOPINATHAN. (World Scientific, 1985.) [Pp. 1048 + xliii.] £124.20. ISBN 0 97197 839 3.

It is practically impossible to do justice to this enormous volume which records the 10 invited and 308 contributed papers to this conference. Almost every facet of this thriving subject seems to have been discussed and their diversity is impressive.

About 40% of the contributions refer to studies of metals and alloys. These papers are somewhat arbitrarily divided into three groups, the largest of which covers defect and vacancy studies. This continues to be one of the most fruitful and intriguing areas of application of positron annihilation (PA). Amongst the topics where progress has been made is the exploration of the effect of the vacancy content on PA.

Another group of papers relate to two-dimensional angular-correlation experiments. These are now beginning to be applied to defect studies in metals as well as achieving remarkable success in band structure studies.

The group of papers dealing with defects in metals is preceded by a summary of a very interesting round-table discussion of this subject which took place at the meeting.

Another substantial group of papers covers similar studies in non-metals (predominantly semiconductors) and polar solids (mostly halides). Temperature studies bearing on the transition from Bloch-type Ps to localized Ps is one of the interesting topics in this group.

The next most numerous set of papers concerns positron-atom and molecule collisions and interactions. Here one finds most of the papers on PA in gases, scattering and ionization cross-sections and Ps formation. This section includes most of the rather few papers with a substantial theoretical content. Data accumulate on the bubble and cavity aspects of Ps and some success has been achieved in calculations of o.Ps pick-off lifetimes. But the early stages of Ps solvation remain obscure.

Only relatively few papers are concerned with experimental techniques. Lifetime spectrometers have reached their limit at a resolution of about 170 ps. The major problem with the Doppler-broadening technique is to maintain extreme stability.

There are, however, some interesting experimental details given in what is, perhaps, the most original group of papers dealing with low-energy positron beams and surface studies. There seems to be a real possibility that PA will soon become an established technique in surface studies.

Only a small number of papers deal with phase transitions. Nonetheless, there were data for alloys, inorganic and organic solids as well as liquid crystals. Still more information on the imperfectly understood effects of micelle formation on Ps distribution in solutions of surfactants is reported.

The previous group overlaps appreciably with the more numerous papers on Ps formation and chemistry. Together these papers amount to about 15% of the total. They include a very useful review of the many unsolved problems found in this area. Amongst the papers exploring magnetic quenching may be mentioned an elegant study using an iron (II) compound displaying spin cross-over. Evidence is provided for the failure of classical transition kinetics with Ps reactions. Much of the interest seems to be moving to Ps in organic liquids.

The last four papers extend the coverage of the conference to astrophysics. Perhaps not surprisingly there is evidence for annihilation radiation coming from the galactic centre. The emission shows an interesting time dependence and it seems probable that important new information may stem from such investigations.

As A. T. Stewart remarks in a concluding summary to the conference, the papers reflect a period of consolidation in PA studies. The period of frequent new discoveries has, for the time being, ceased. But who can say what the more laborious, but precise, studies now taking place will reveal.

A. G. MADDOCK  
University Chemical Laboratory,  
Cambridge