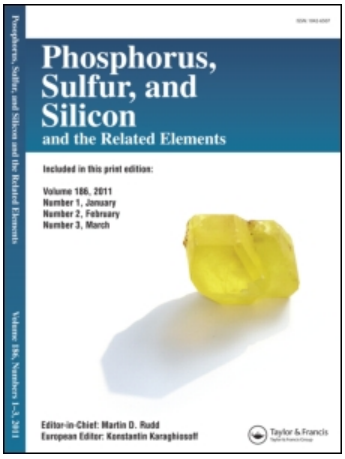

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Preface

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PREFACE

Phosphorus Chemistry in 1986, a review of the Bonn Conference

International conferences exclusively concerned with the chemistry of phosphorus have a long tradition. The first in honor of Georg Wittig, the late Nobel prize winner, was held in Heidelberg in 1964. Following conferences were organized in Schloß Elmau, Prague (twice), Gdansk, Paris, Halle, Durham and Nice making Bonn the 10th. Not all were sponsored by the IUPAC and some were concerned only with parts of phosphorus chemistry such as the 1970 Prague-Conference on Inorganic Phosphorus Chemistry.

The element, phosphorus, on account of which chemists are engaged in numerous and different areas is as such associated with inorganic chemistry. In its combination with other elements, particularly with carbon, it shows so many facets, often unlike any other element, that today in research and application scientists of various disciplines are engaged in dealing with phosphorus compounds. Phosphorus, therefore, became an element that links very different fields of science.

Consequently, 410 scientists from 32 nations attended this conference and scientific results from nearly all fields in which this element has a key function were presented and discussed in 135 lectures and 244 posters.

The variegated palette of presentations was subdivided in four sections including basic as well as applied chemistry. The strongest section was again reactivity and mechanism of reactions of phosphorus compounds, comprising 59 lectures and 95 posters, followed by phosphorus in particular coordination and bonding states with 49 lectures and 60 posters. The importance of phosphorus compounds in biological processes, including the application of ^{31}P-n.m.r.-spectroscopy supporting medical diagnostics, aroused considerable interest and was dealt with in 17 lectures and 16 posters. Deliberately separated were nearly all themes concerning phosphates and fertilizers, which are covered by the specialized IMPHOS-Conference, held first in Rabat, then Boston and lastly in Brussels.

The contributions were, with respect to the unanimous opinion of the International Board, of high quality and showed important and fundamental results. This applies to all areas of basic and applied research. Some examples, which of course may reflect the individual interests of the organizers, were the determination of the crystal structure of white phosphorus modifications. This was an interesting coincidence because the structure of the red modification had been determined earlier in Bonn. The presentation of P_x-Hückel-systems as complex ligands and the presentation of a new less toxic herbicide were also highlights. Very impressive was again developments in the field of phosphorus in lower coordination states, particularly the synthesis of compounds with PP- and PC-$p\pi$-bonding and the blossoming of their coordination chemistry. In the

biochemistry section new syntheses of DNA and RNA were reported and also remarkable was the analysis of the mechanism of the inhibition of proteases by phosphonate derivatives; this advance will probably initiate many new developments.

Thirty lecturers attended the conference as invited speakers, who in the opinion of the National Scientific Committee have brought forward remarkable results since Nice. As initiated first in Durham, lectures of only 30 minutes, no plenary or short lectures, were scheduled. This format has received general approval and should be preserved in future conferences. The initiative launched in Nice to install only two parallel sections could not, with respect to the great number of presentations made, be fulfilled. All contributions were accepted for two reasons. First, there was the three-year interval between Bonn and Nice, creating more novel results instead of simply modified findings and judging the quality of a contribution on the basis of a short abstract is rather difficult. Second owing to budget reasons, as many participants as possible were preferred.

Compared with the first conference in Heidelberg, there has been tremendous evolution during the past two decades. At that time participants from half a dozen nations attended the conference; today, 32 different countries are represented. Many fields of research, for example lower-valent phosphorus compounds in which more than a dozen groups are competing today, did not exist in the past.

On the other hand, what a change with respect to the emerging ecological aspects of phosphorus chemistry. In Heidelberg the Nobel prize winner Richard Kuhn opened the conference with the words: "Indeed, I am not a phosphorus chemist, but one thing I know for sure from my childhood, and I quote my father always reminding us, children, eat lecithin, lecithin contains phosphorus and phosphorus is good for your brain". Today we look at it in a more critical way. Not everything that contains phosphorus serves us well. Among its compounds we find highly toxic substances, like phosphoric acid esters, as insecticides; even orthophosphoric acid and its salts, essential for fertilizing and subsequently for our nutrition has come under review since overferilizing by farmers leads to contamination of groundwater and eutrophication of lakes.

Nevertheless, without phosphorus there is no life. Therefore, phosphorus-containing compounds are essential materials and research in this field should not be hindered. To secure food for the increasing world population, we need more intelligent and controlled phosphate fertilizers, insecticides and plant protectives. Just as much intensive research in various areas will be necessary to substitute for products which, in cases of incautious handling may be dangerous, by new, better and environmentally adaptable compounds.

An agreement between IUPAC and Gordon and Breach made it possible that these proceedings be published in Phosphorus and Sulfur. They consist of dense 4-page synopses of the lectures as well as the abstracts of the posters which were presented. The proceedings reflect the most recent advances and present trends of our discipline and will undoubtedly constitute a valuable tool in the hands of all phosphorus chemists.

Finally, the editors wish to express their deep appreciation to all those who contributed to making this conference a success: the speakers, the chairpersons,

the members of the International and National Scientific Board and the co-workers of our Organization Committee.

Additionally, we are very much obliged to all institutions and companies who with their financial support have contributed decisively to this conference. The generous support of the Federal Minister of Research and Technology made it possible to provide 120 participants with travel, accommodation and registration grants.

We hope that in addition to the active participants, the 63 accompanying ladies and guests enjoyed the social events: the get-together, the baroque concert, the boat trip and the Rittermahl and that these were good opportunities to renew old and form new friendships. We hope that all participants will remember these pleasant and stimulating days in Bonn and we are looking forward to our next Phosphorus family meeting in Tallinn in 1989.

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