PREFACE

The Sixth International Symposium on Intercalation Compounds (I.S.I.C.6) was held in Orléans (France) from May 27 to May 31, 1991 and the present volume is the proceedings of the scientific papers presented in the lecture room of the Regional Council of the "Region Centre". It was organized by the Center of Research on Divided Matter constituting a research unit of the National Center for Scientific Research (C.N.R.S.) and of the University of Orléans.

The 196 participants came from France (76), Germany (31), USSR (19), Japan (19), Spain (7), USA (7), Israel (5), Poland (5), Belgium (4), United Kingdom (4), India (4), Sweden (3), Bulgaria (2), Hungary (2), Italy (2), Brazil, Canada, Eire, Greece, Netherlands, Switzerland (1 each). This number of participants is substantially larger than that of the previous Symposiums : 75 in Jerusalem (1987) and 135 in Berlin (1989) and it is undoubtedly a consequence of the broadening of the scope of the Symposium to substrates other than graphite, as recommended by the International Committee at the close of the Berlin meeting. Moreover, and for the first time in this series of Symposiums, the number of participants from Eastern Europe (28) was particularly important, thanks to a generous funding by the C.E.E. (European Economic Community), the French Ministry of Research and Technology, and the C.N.R.S.

The scientific part of the meeting consisted in 74 oral presentations and 87 posters, to which two full afternoons were devoted. The proportion of papers presenting results concerning intercalation in substrates other than graphite (35%) was higher than in the previous Symposiums : there were none in Jerusalem, and the proportion was only 17% in Berlin. The actual number of papers on the intercalation compounds of graphite was 103, to be compared with 84 in Jerusalem and 113 in Berlin, showing that activity in this field is still high. For the other substrates, the numbers were : chalcogenides of transition metals, 21 ; oxides other than perovskites, 13 ; lamellar phosphates, 5 ; perovskites, 4 ; conducting polymers, 3.

Independently of the nature of the substrate, the subjects of the papers were centered on the following themes :

- the synthesis of new compounds by chemical, physical (i.e. high-pressure) and electrochemical methods ;

- the study of physical properties, such as charge transfer, electrical conductivity, structural transitions, superstructures, magnetic properties, surface properties ;

- theoretical studies of electronic or phonon band structures, X-ray diffraction by defective lamellar stackings, thermodynamic properties, electrical conduction by various charge carriers ;

- the use of intercalation compounds as reagents in organic synthesis, for the separation of isotopes, in rechargeable batteries, or as catalysts.

There were also 12 papers of general interest, among which one should mention the reaction of alkali metals on C_{60} and other fullerenes and, especially, the lecture "Supramolecular chemistry : from molecular recognition towards molecular information processing and self-organization" given by Professor J-M. LEHN, 1987 Chemistry Nobel Laureate, in which were presented some of the possibilities provided by synthetic chemistry for molecular engineering.

During its meetings, the International Committee of the Symposium reaffirmed its wish of maintaining the bi-yearly meeting in its present form, namely with a majority of presentations dealing with subjects directly connected with various aspects of intercalation in graphite. Furthermore, in order to avoid the need of parallel sessions, it was generally agreed that the total number of papers be kept, at most, to the present level. Lastly, the International Committee decided that a number of specialists in the fields of intercalation in non-graphitic substrates would be invited to join the Committee.

Tentatively, the venue of the next Symposium was chosen to be Moscow, in 1993.

Finally, we would like to thank all those who helped us in the organization of the Symposium, and, our colleagues of the Center of Research on Divided Matter, more particularly J. CONARD, P. LAUGINIE, R. SETTON and D. TCHOUBAR.

F. BEGUIN
H. ESTRADE

FOREWORD

The great number of new countries participating in this conference led to a few difficulties with language, standard presentation and mailing, but it also resulted for us in the discovery of many new research groups and teams, and we are glad to offer this possibility to our colleagues.

The papers are grouped approximately by topic and sample category. All the contributions submitted were refereed by competent reviewers, and about 95% of the papers were modified by the authors We undertook the correction of a few texts for which the corrected version could not be retrieved. All the papers presented in the oral or poster sessions are in the proceedings, at least as an abstract with the address of the author(s) from whom the complete text can be obtained if further details are required.

We have included the text of a letter written in 1931 by V. Grignard, 1912 Chemistry Nobel laureate, offered during ISIC 6 to J.-M. Lehn, also Chemistry Nobel laureate (1987). It illustrates the complexity of the task required from the editor of a scientific piece of work, and the elaboration, by the same scientist, of the chemistry nomenclature later internationally adopted. May it serve as an example of the patience required, then as now, to contribute to the growth of knowledge.

Finally, we would like to thank R. Setton for his help in the particularly stressed and hurried final editing stretch.

The Editors

A PAGE OF THE HISTORY OF CHEMISTRY: THE BIRTH OF MODERN ORGANIC CHEMISTRY NOMENCLATURE AND EVERYDAY LIFE IN 1931 FOR A CHEMISTRY NOBEL PRIZE LAUREATE

Ralph Setton

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The Manuscript of the following letter was presented to Professor J.-M. Lehn, 1987 Chemistry Nobel Prize Laureate, during the banquet in the evening of May 30, 1991, as a token of appreciation for his contribution to the success of ISIC 6. The writer of the letter is Victor Grignard (1871-1935), also Chemistry Nobel Prize Laureate (1912) and inventor in 1901 of the organo-magnesium compounds, perhaps the most versatile tool available in synthetic organic chemistry. Besides a number of interesting personal details, the letter contains an example of the organic chemistry nomenclature developed by V. Grignard and later adopted internationally.

I had found the letter in 1950 behind a drawer of my desk at the Sorbonne in Paris, in the laboratory of Professor HACKSPILL under whose guidance I was doing work in inorganic chemistry for a PhD. In spite of our efforts, neither Professor HACKSPILL nor I could determine the person to whom the letter was destined. The matter lay dormant until, as advised by Professor J. FRIPIAT in 1982, I sent a copy of the letter to Professor A. BRUYLANTS of Louvain (Belgium) who, I believe, had written a biography of V. GRIGNARD. As found out by A BRUYLANTS [Bull. Classe Sciences, (1985) 71, p. 418] from R. GRIGNARD, son of the Nobel Laureate, the letter had undoubtedly been sent to Mr. Paul BAUD, General Secretary of the Treatise on Organic Chemistry. Out of the ten volumes initially planned, only two were published before the death of V.GRIGNARD but the untertaking was later completed and became an encyclopedic, twenty-three volume reference work to which ninety-eight authors had contributed.

Lyon, April 29, 1931

Dear Sir,

I must go to Paris next Monday, May 4. We can use this opportunity to examine which tasks can be immediately distributed. Father Senderens just wrote to say he will be coming to Paris at the end of May and that he would like, on this occasion, to complete the bibliography he will need; he would therefore like to know exactly the subjects alloted to him.

I have settled directly with Mr Karrer matters relative to his collaboration; there were no difficulties as there were no propositions doubling his.

I have corresponded once again with Mr Swarts, and have asked him to deal with all mono- and polyhalogenated derivatives in all series. There has been no answer from him for a fortnight: he therefore accepts. Mr Auger wrote*; he wishes to see me to arrange a partitioning of his article; I believe it will be possible to satisfy him. I shall be in Paris Monday and Tuesday till 4 in the afternoon, and will leave at 5 p.m.; Monday afternoon will be taken up by the Institute and the Commission; furthermore, I shall have to see the Director. I believe we could therefore meet on Monday morning at your laboratory at 9 a.m. and, should that be necessary, on Tuesday at the same time to meet Mr Auger whom I would like you to inform of this appointment.

The matter of the Albuminoids should also be settled. I have not yet completed the nomenclature, but it is progressing in spite of numerous difficulties. If I could meet Mr Delépine, I could submit to him my proposals concerning the points which were not settled by the Commission.

Here, for instance, is a purposely chosen, very complicated case:

I take, as main chain, the linear chain uniting all the cycles. In each of the latter, the number of the C atoms are accented. Lastly, the lateral chains of the cycles are identified by the number of the C atom to which they are attached, with each carbon of the chain itself identified by an index. With these conventions, which are quite general, all the C atoms are numbered and thus unambiguously defined, and the name of the compound will be

hydroxy-4' dimethylamino-4'' (amino-4_3'' propanone 4_2'')-4'''
triphenyl-(2-1', 6-1'', 4_1-1''') methyl-4 heptanol-4 oic (acid).

Please ask Masson, the editor, if this notation involves typographical difficulties. In actual practice, however, it would only need to be applied to much simpler cases. During the first meeting of all the collaborators, I was asked not to use letters to distinguish among the C atoms of a cycle. I have avoided letters, but something will always be required. If there is only a single cycle, one can do without the accent, and the lateral chains can be referred to its fundamental skeleton.

If my train is not late, I shall get to Paris on Sunday evening, at 7 p.m. At 8 p.m., I'll go for dinner to the Balzar, at the back, in the right-hand corner. If you like, you could come for a chat, or you could leave a message at the hotel to let me know where I could reach you the next day.

Yours faithfully,

V. Grignard

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* As well as Mr Fosse; I hope to see him on Monday.
Mr Martinet also wrote to find out how thigs stand; I told him that the general instructions would soon be forwarded.

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DE L'UNIVERSITÉ
67, Rue Pasteur
LYON
TÉLÉPH : ~~VAUDREY~~ Parmentier 22-44

Lyon, le 29/4 1931

Cher Monsieur

Je suis appelé à Paris, lundi prochain, 4 mai. Nous pourrons en profiter pour examiner quel travail on peut répartir immédiatement.

L'abbé Senderens vient de m'écrire qu'il doit venir à Paris dans la fin de mai et qu'il voudrait en profiter pour compléter la bibliographie dont il aura besoin ; il désirerait donc être fixé sur ce qu'il doit traiter.

J'ai réglé directement avec M. Karrer sa part de collaboration ; il n'y avait aucune difficulté puisqu'aucune proposition ne se superposait à la sienne.

J'ai correspondu de nouveau avec M. Swarts et lui ai demandé de traiter tous les dérivés mono- et polyhalogénés dans toutes les séries. Il n'a rien répondu depuis plus de 15 jours ; c'est donc qu'il accepte. (x)

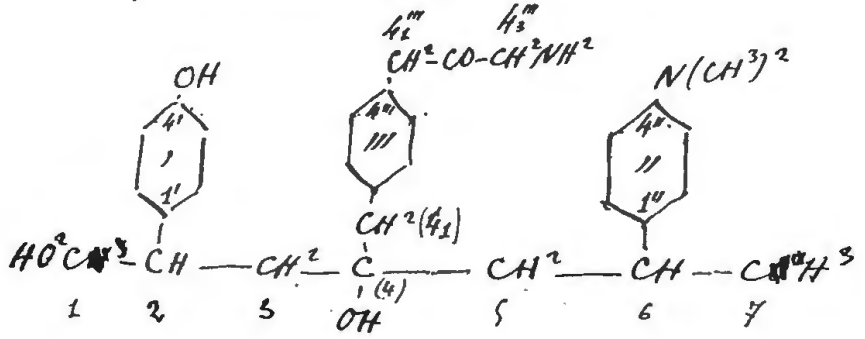
M. Auger m'a écrit ; il désire me voir pour arranger le fractionnement de son article ; il sera possible, je pense de lui donner satisfaction. Je serai à Paris lundi et mardi jusqu'à 16 heures, pour repartir à 17 h. L'après-midi de lundi sera pris par l'Institut et la Commission ; j'aurai en outre à voir le Directeur. Je pense donc que nous pourrions nous réunir, à votre laboratoire, le lundi matin, à 9 h., et le mardi matin, à la même heure, si cela est nécessaire, et y rencontrer M. Auger que je vous prie de vouloir bien prévenir pour fixer ce rendez-vous.

Il faudrait bien aussi essayer de trancher la question des Albuminoïdes

(x) M. Fosse également ; j'espère le voir lundi. M. Martinet m'a écrit aussi pour savoir où nous en étions ; je lui ai annoncé l'envoi prochain des Instructions g[énérale]s

Je n'ai pas encore terminé la Nomenclature mais elle s'avance peu à peu, non sans rencontrer de sérieuses difficultés. Si je puis rencontrer M. Delépine, je lui soumettrai mes propositions sur les points qui n'ont pas été réglés par la Commission.

Voici, par ex., un cas très compliqué que j'ai choisi à dessein :



Je prends comme chaîne principale la chaîne linéaire qui réunit tous les cycles. Dans chacun de ceux-ci, les nos des atomes de C sont accentués. Enfin les chaînes latérales des cycles sont numérotées par le no du C point d'attache affecté d'un indice numérique. Avec ces conventions, [illegible]

de C sont numérotés, donc définis, sans ambiguïté, et le nom de ce corps sera

hydroxy-4' diméthylamino-4''
(amino-4₃''' propanone-4₂''')-4'''
triphényl-(2-1', 6-1'', 4₁-1''')
méthyl-4 heptanol-4 oïque

Je vous prie de demander à la Maison Masson si cette notation ne soulève pas des difficultés typographiques. Dans la pratique, d'ailleurs, on n'aura à l'appliquer qu'à des cas beaucoup plus simples.

Quand nous avons tenu notre première réunion, entre collaborateurs, on m'a demandé de ne pas introduire de lettres pour désigner les atomes de C des cycles. J'ai évité les lettres, mais il faut toujours quelque chose

S'il n'y a qu'un seul cycle, on peut se dispenser de l'accentuer et c'est à lui, comme squelette fondamental, que l'on rapporte les chaînes latérales.

Si mon train n'a pas de retard, j'arriverai à Paris dimanche soir à 19 h. A 20 h., j'irai dîner au Balzar, dans le coin de droite, au fond. Si cela vous dit, vous pourrez venir causer un peu ; ou bien vous me laisserez un mot à l'hôtel pour que je sache comment

Cher Maître, à vous sentiments très dévoués