PREPARATION OF CATALYSTS

Scientific Bases for the Preparation of Heterogeneous Catalysts

B. DELMON, P. A. JACOBS AND
G. PONCELET
(editors)

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Scientific Bases for the Preparation of Heterogeneous Catalysts

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Editors

B. DELMON, P.A. JACOBS AND G. PONCELET

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It is a great pleasure for me to name here all those who have made this symposium possible, who have helped overcome the difficulties related to the impredictible growth in the number of registrants in the latest weeks before the symposium, and who, finally, have made everything run surprisingly smoothly in spite of this near overgrowth. It is really impossible to rank the various contributions according to their values. Please consider the order which has been adopted hereafter as completely stochastic.

In the name of the Organizing Committee and of the Société Chimique de Belgique, we thank those who have submitted papers, in such generous number (77 papers) that it turned out to be extremely difficult to select the ones best fitting the topics of the meeting. There were participants from 27 nations. We thank them too for having come here; but we also express our deep regret that the latest registrations could not be accepted.

We thank Solvay Company and its directors, Dr. F. BLOYAERT and Mr. R. MORMONT, for the hospitality, and Dr. A. LECLOUX for having supervised remarkably so many arrangements and re-arrangements. The organization of the department headed by Mr. A. GRODENT was responsible for Solvay's reception, projection, photography and sound amplification. All participants will certainly remember the smiling help of Mrs. A. LUGARIC and her group: Miss J. THEYS, Mrs. M. DELPLANQUE, Miss N. MERTENS and Mr. A. CALISTRI. Mr. A. ROGGEMAN was in charge of projection and photography. Sound amplification was the responsibility of Mr. L. ASSELBERGHS and Mr. C.DEROOSTER. I wonder whether the most remarkable achievement is not that of the Chef who prepared lunch for so many people

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Dr. A. LECLOUX (Solvay)
Prof. G. L'Homme (Université de Liège)
Prof. J.B. UYTTERHOEVEN (K.U.L.)

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In the difficult circumstances resulting from a nearly overflooding of the Symposium by registrations, Dr. G. PONCELET has proved to be really a great organizer. We owe many thanks to Dr. P. JACOBS and Dr. G. PONCELET for their success.

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B. DELMON

Président
Division de Catalyse
Société Chimique de
Belgique

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GENERAL REMARKS

At the moment the Organizing Committee had decided on the subject, the hope was that this Symposium could constitute a discussion of various scientific problems which are involved in the manufacture of real, industrially used, heterogeneous catalysts. Catalysts are solid materials or solid chemical products, possessing a high market value on a weight basis. The intention was to discuss in an international meeting the scientific domains on which the activity of an important, well distinct, branch of industry rests. The hope was that as little catalysis as possible would be mentioned. Indeed, the preparation of a solid material involves mainly solid state chemistry and adhesion phenomena. Since such a solid material has a complicated texture and a well-developped surface area, manufacture also implicates colloid chemistry and various interface phenomena in addition to adhesion, diffusion and mobility processes in the solids or at their surface. The technology involved is related to other fields, principally to the manufacture of ceramics, powder technology, surface treatments, technical realization of adhesive joints between metal and/or ceramics, materials technology, and cognate areas. The hope was that the symposium would help to define better the fundamental phenomena involved and the technical similarities. People in charge of the manufacture of catalysts are often catalysis-minded or at least are working in such an environment. Some extra-disciplinary contributions, as well as multi-disciplinary approaches, are thus clearly necessary.

The goal of the symposium was certainly ambitious. It must be useful to evaluate its accomplishments (if any) and deficiencies.

IS THE MANUFACTURE OF CATALYSTS CONCERNED WITH BASIC SCIENCE ?

A disappointment from this meeting (but not completely unexpected) has been that so few communications have been presented by industrial laboratories. There are two over-repeated explanations for this fact: (i) catalyst manufacturers

are reluctant to divulge secret preparation details, many of which are of paramount importance; (ii) catalyst fabrication is trial and error, foreman's know-how and tradition, and is not amenable to scientific analysis. Both explanations certainly contain their share of truth.

However, lobby and dinner conversation, even between competitors, usually goes well beyond what is said during sessions. To the outsider, it often seems that the first explanation is used as an apologizing escape.

Although fairly unaware of the industry's problems, researchers working in an academic environment commonly adhere to the second hypothesis. There is hardly any academic investigator who has not been faced with the extremely difficult problems of reproducing a catalyst, not only when undertaking to synthesize some formulation described in the literature, but also when preparing a second batch of his own catalyst. When attempting to decribe precisely the preparation technique in the experimental part of a scientific paper, the academic investigator invariably discovers that this description (i) is closer to a cooking recipe than to the product of a scientific approach (e.g. how can stirring be quantified: as moderate or high; why is a 1 hr ageing period necessary and longer or shorter times inadequate ?) and (ii) in spite of his efforts only conveys a small part of (probably) relevant information. Consequently, the cooking recipe, even casually read by some chef, will produce a valuable product, whereas the industrious ungifted people will not be helped much.

The second hypothesis, namely that making catalysts is art rather than science, finds additional support in the fact that the authors of many communications at the Symposium reported new and interesting effects and unexpected correlations, but had difficulties in interpreting them. It seems very likely that many authors, at the moment they propose a communication, discover that the number of their results which can be translated in conventional scientific words and could fit the traditional format of a scientific paper is substantially less than anticipated. For all investigators, academic as well as industrial, it may seem difficult to express publicly views,