

REPORT of the INTERNATIONAL ADVISORY BOARD RESEARCH ACTIVITIES of 2007

Institute of Catalysis and Surface Chemistry, PAS

Introduction

Catalysis and Surface Chemistry constitute a field at the interface of chemistry, physics, biology, engineering and material sciences that enables chemical processes to be realized with cost-, energy- and eco-efficiency, thus making a key contribution to: (i) sustainable energy and mobility, (ii) the rational use of resources, (iii) quality of life, and (iv) health and environment protection.

To address these relevant socio-economical issues it is necessary to have a critical mass of well integrated competences, which can combine the fundamental knowledge and an applied vision.

Research, education and promotion of science

The Institute of Catalysis and Surface Chemistry PAS is well suited to achieve the above objective and has its points of strength in the following aspects:

- The Institute has a leading position in Poland, and its core part has worldwide visibility. It is well positioned in the European Research Area. Remarkable is the high number of research contracts with European research funding agencies, and participation in European networks on catalysis and surface science.
- The Institute has a fundamental approach to catalysis and surface chemistry, which is relevant for transfer of knowledge and innovation.
- The Institute has multi-disciplinary competences ranging from surface and colloid science, material synthesis via characterization up to catalysis. It combines theoretical and experimental expertises. It provides a forum for sharing ideas and concepts as applied to catalysis and surface chemistry.
- The number of publications and conference contributions, keynote and plenary lectures at domestic and international meetings, has increased markedly in the last two years.
- The number of PhD students is satisfactory, and the Institute achieves excellent integration of research and education.
- The effort towards public awareness on science is outstanding.

Funding aspects

Running an Institute with a strong fundamental research programme requires a good balance of institutional, national and international fundings. As stated in our previous report, the financial “situation appeared not to be fully satisfactory”. It is even worse at present: the institutional fundings are too weak. To get an optimum performance of the Institute a substantial increase of this budget is required. Flexibility in the assignment of funds will also help the governance.

Personnel policy

Though the number of PhD students is satisfactory, it is clearly limited by the funds available. To make full use of the capacity of knowledge transfer and to increase the number of Ph.D. positions, an external funding source, such as the one used for Polish universities, is needed.

The fundamental research vision of the Institute requires continuity in human resources and knowledge transfer. The ageing of the senior group leaders calls for a policy for incorporation, integration and promotion to leadership positions of younger researchers.

Cooperation and integration among different research groups on common research projects, though improving, needs to be further strengthened.

Scientific productivity

The production of scientific publications has clearly increased. A higher proportion of publications in top international journals in the specific fields of competence of the Institute is recommended.

The number of patents is relatively small. However, given the basic character of the research conducted at the Institute, this is not a key issue. Applications for patents are justified only when there is an economical or industrial interest behind. Therefore, an increase of the contracts with industry, adequately and possibly catalyzed by the Ministry, is strongly encouraged.

Recommendations

The leadership of ICSC should be congratulated for attracting a high contribution of external funds. Nevertheless, this should not prevent the Ministry to provide sufficient basic funding for the Institute.

However, there appears to be little advance in some of the directions recommended in the previous report. An effective integration of all the competences in the Institute (material synthesis, characterization, catalyst testing and modelling, surface chemistry) under a common vision of the research should be further encouraged to strengthen the leading position of the Institute. In particular, a stronger effort should be made to increase the relevance of catalytic reaction studies.

The Institute keeps a good collaboration with external groups, which allows complementing its present research competences, with others such as reactor engineering, as well as the training of their researchers. A similar collaboration with industry should be put in place.

The fundamental research vision of the Institute requires continuity in human resources and knowledge transfer. In this respect, it is essential to pay attention to the age distribution of the research staff. A personnel policy should be adopted to maximize the transfer of knowledge and to promote the leadership of younger researchers.

While the Board is invited to review the activity of the Institute performed during a 2-years period, the report covers just one year. The present format of the report, probably satisfactory for administrative purposes, is not well suited for scientific evaluation. A suggested structure could be: i) an executive summary; ii) scientific part (which references to supporting publications, running projects, etc.); iii) outline of main achievements and iv) future prospects.

Signatures of the Members of the International Advisory Board of the
Institute of Catalysis and Surface Chemistry, Polish Academy of Sciences:

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Valentin N. Parmon, Dotchi Exerova, Blanka Wichterlová