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22065

ICS - UNIDO WORKSHOP

on

„New Catalytic Systems and Processes Applicable to Small and Medium Enterprises“

September 28 - October 3, 1998

Bratislava

Slovak Republic

Final Report

UNIDO Project No.: TF/GLO/96/105

Contract No.: 98/205

Prepared by: Prof. Milan Hronec

Faculty of Chemical Technology

Slovak University of Technology

Bratislava

Slovak Republic

October 1998

1. Background

Nowadays, catalysts are used in the production of petrochemicals, bulk chemicals, pharmaceuticals, fine chemicals and in other branches of chemistry. The expectations for the 21st century concerning catalytic materials demand are in favour of an 4 - 6 % increase in fine chemicals production as a consequence of the increase in their consumption, especially in the developing countries. The reason is that presently used technologies for the production of specialty chemicals are now being reevaluated from the point of view of environmental impact and energy requirements. The industrial and social interest is essentially in the reduction of contamination of effluents by the use of catalysts instead of reagents which are often applied in stoichiometric amounts and subsequently produce large quantities of valueless salts, which induce pollution. Therefore, a key point for the future is the development of clean technologies.

The meeting of the expert group on catalysis, held at the International Centre for Science and High Technology (ICS-UNIDO), Trieste, Italy, in the period April 27.-29. 1998 has decided to organize the workshop in the Slovak Republic. The aim of the proposed workshop was to transfer the information on new catalysts and catalytic systems applicable in fine chemicals synthesis to people in Central and Eastern Europe working in the field of catalysis and developing of new processes of fine chemicals production.

2. Objectives

The main objectives of the proposed Workshop were:

- To bring experts from universities, R & D institutions and industry working on catalysis and preparation of specialty chemicals in order to develop in the near future environmentally clean technologies for the production of these types of chemicals.
- To identify regional R & D institutions in developing countries through contacts established with the participants in the workshop and to give the ICS an opportunity of identifying qualified centers to be considered as future cooperative institutions for the ICS network.
- To evaluate possible follow-up project proposals of feasibility studies under the ICS coordination.

The lectures of the Workshop covered the following areas:

- Overview of clean industrial catalytic processes

- Specifics of fine and bulk chemical production
- Zeolites and solid acids and bases
- Oxidation and hydrogenation catalysts
- Reactor engineering in fine chemicals production

3. Time and Venue

The Workshop was held at the Faculty of Chemical Technology, Slovak University of Technology in Bratislava from September 28 to October 3, 1998.

4. Organization

The Workshop was jointly organized by the International Centre for Science and High Technology (ICS), Trieste, Italy and the Faculty of Chemical Technology, Slovak University of Technology (FCHT-SUT) in Bratislava, Slovak Republic.

Organizational support was provided by the FCHT SUT and the workshop was financially supported by the Association of Chemical and Pharmaceutical Industry of the Slovak Republic and Ministry of Education.

Scientific Committee of the workshop:

Prof. Ferruccio Trifiró, University of Bologna, Italy

Prof. Stanislav Miertus, ICS-UNIDO, Trieste, Italy

Prof. Milan Hronec, FCHT SUT, Bratislava, Slovak Republic

Prof. Jozsef Margitfalvi, Academy of Sciences, Budapest, Hungary.

The Organizing Committee was composed of the members of FCHT-STU, Bratislava

Prof. Milan Hronec, Chairman

Mrs. Eva Šuleková

Mrs. Anna Ledecká

Ing. Katarína Fulajtárová

Dr. Alexander Kaszonyi.

5. Lecturers

Scientists and experts specialized in catalysis, reactor engineering as well as in environmental aspects were invited as lecturers of the workshop. Three lecturers were from

universities, 3 from research institutions and 2 from academies of sciences. The list of the speakers is attached in Annex I.

6. Participants

Invitations and calls applications were sent to various universities, research institutions and industrial chemical and pharmaceutical companies in Central Europe and the Slovak Republic. Since the number of applicants was higher, the selection was conducted by the Organizing Committee in cooperation with ICS. The criteria for selection were

- Consideration of geographical distribution of participants coming from the different Central European countries (Table 1)
- A balance was sought between participants from industry and industrial research centres and those from universities and national academies.
- Professional carrier relevant to the subject.

Table 1 *Geographical Distribution of Selected Participants*

Country	Number of Participants
Bulgaria	3
Croatia	1 (appologized)
Czech Republic	4
Hungary	3
Latvia	1
Poland	1 (appologized)
Romania	2
Slovak Republic	22
Ukraina	1
Yugoslavia	3

For the Workshop were selected 41 participants and 8 speakers. All speakers and 17 international participants (2 were appologized three days before the beginning of the Workshop) were fully sponsored by ICS-UNIDO, covering their travel, accommodation and living expenses. 16 participants from the Slovak Republic were supported partially (only full

board or food) by ICS-UNIDO and 6 participants attended the Workshop on their own expenses.

The institutional distribution of the participants attending the Workshop is in Table 2. The complete list of the selected participants (including 2 apologized) is attached in Annex II.

Table 2 Institutional Distribution of the Participants

Institution	Number of Participants	Sponsored by ICS UNIDO
Universities	15	9
Academies of Sciences	8	8
Industrial Research Centres	11	11*
Industries	5	5*

* sponsored partly by ICS UNIDO

7. Materials Distributed

Participants from each institution were provided with general programme, list of participants and lecturers and ICS-Aide Memoire. At the end of the Workshop were distributed xerox copies of all lectures.

8. Programme

The Workshop was held at the Faculty of Chemical Technology, Slovak University of Technology. The Workshop was opened by Vice-rector of the Slovak University of Technology, Prof. M. Veselý who shortly informed participants with the structure of the University and the importance of the Workshop for the development of clean chemical technologies in the region of Central and Eastern Europe.

The opening ceremony attended His Excellency Dr. Egone Ratzenberger, the Italian Ambassador to the Slovak Republic, John Allen, representative of the United Nation Development Programme in Bratislava and Prof. Stanislav Miertus, ICS Area Coordinator. In their opening greetings they emphasized the role of these types of workshops for the development of economy in countries of Central and Eastern Europe.

After the opening ceremony Prof. Miertuš delivered a lecture on programmes and activities of ICS-UNIDO in the field of chemistry and biochemistry.

The scientific programme of the Workshop consisted of lectures from selected topics of catalysis and reactor engineering. Enough space in the programme was devoted to the contributions of participants describing the current research on catalysis and production of specialty chemicals in their home countries or in their institutions. During these presentations, a discussion was held on the possibilities concerning the improvement of environmentally harmful reaction steps by catalytic ones and on cooperation between participating countries in various research areas.

All lectures were delivered by foreign experts from universities and research institutions. One half a day was organized for all participants an excursion to the Research Institute of Organic Technologies (VUCHT) in Bratislava. A scientific programme of the workshop is enclosed in Annex III.

At the end of the Workshop the participants received a certificate confirming their attendance in the Workshop (Annex IV).

9. Financial Support

For all invited speakers were payed travel expenses and transportation costs from the Vienna airport to the hotel and full accommodation. The speakers were accommodated in hotel Tatra, very near to the Faculty of Chemical Technology. Foreign and some domestic participants were accommodated in the guest rooms belonging to the Slovak University of Technology.

All speakers and participants were provided with breakfast, lunch and dinner. During the coffee break, in the morning and in the afternoon, coffee, tea and soft drinks were served.

10. Funding

The Workshop was sponsored by ICS-UNIDO. This contribution was 11.567,- USD, which is the sum much lower than that planned for this activity (30 000.-USD). A support was

received also from the Ministry of Education and the Association of Chemical and Pharmaceutical Industry of the Slovak Republic to cover various expenses connected with the organization of the Workshop and expenses of their nominated participants. The contribution of the Faculty of Chemical Technology was devoted for the purpose of covering: printing materials, mails, faxes, telephone calls, certificates, etc.

The expenditures charged to the contribution of ICS-UNIDO are summarized in Table 5.

Table 5 Expenditures Charged to the Contribution of ICS-UNIDO

Item	US\$
Travel expenses of speakers	4.707
Travel expenses of participants	1.394
Accommodation of speakers and participants	2.786
Meals	2.680
Total	11.567
Receipt from UNIDO (Proposal)	24.000 (30.000)
Balance	12.433

11. Results

Most of the participants expressed in the completed questionnaires submitted to ICS-UNIDO their satisfaction with the scientific content and organisation of the Workshop. They stated that during the Workshop, interaction among participants coming from universities, industry and research centres of the different countries was established. This will give in the near future a chance to promote joint activities between countries in research and mobility of scientists and PhD students. The participants requested to organize further workshops or courses focused on specific problems in catalysis research and in the development of technologies for fine chemicals production.

The Workshop has succeeded in its objectives and the participants obtained the latest knowledge regarding the use of catalytic processes in the production of specialty chemicals.

12. Conclusions and Recommendations

The main attention of the workshop was to promote the development of clean technologies for the production of specialty chemicals using selective catalytic steps. Selected lectures from different fields of catalysis gave the participants information on the latest development in the application of catalysis in the synthesis of complex molecules. On the other hand presentation of current problems existing in the countries of Central and Eastern Europe by the participants from these regions provided topics for further research activities and possible improvement of existing technologies. The better knowledge of existing problems gives a chance for co-operation and integration between institutions participating in the Workshop in various research areas.

The discussions proceeding during the Workshop led to several new ideas and recommendations, which can be summarized as follows:

- participants were asked to prepare Country reports where will be included the present state of the situation in the production of fine chemicals by environmentally harmful technologies, development of new processes, research activities in the field of catalysis with the emphasis on fine chemicals production
- in the future, courses or workshops will pay more attention to the presentation of case studies presented by speakers from the industry
- one course or workshop should be aimed at stereospecific synthesis
- UNIDO should suggest concrete projects which it is ready to finance and for which individual countries will apply

- to create a data-base of fine chemicals production and provide a short description of technologies used for their preparation
- to develop an effort to overcome the existing gap between scientists working in the field of catalysis and pure organic chemists
- participants from Romania expressed their readiness to prepare a project oriented on the preparation of fine chemicals using clean catalytic processes
- to improve the collaboration between universities, research institutions and industry
- to support grants for young researchers or PhD students working in catalysis to spent a certain time in high standard laboratories

Annex I

LIST OF SPEAKERS

No.	NAME	INSTITUTION	Tel.No.	e-mail	Telefax
1	Prof. GALLEZOT Pierre	Inst. de Recherches sur la Catalyse 2, Avenue A. Einstein F-69626 Villeurbanne Cédex F r a n c e			+33472445399
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Annex II

LIST OF PARTICIPANTS

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Annex III

THE PROGRAMME of the WORKSHOP „New Catalytic Systems and Processes Applicable to Small and Medium Enterprises“

Monday 28.9.1998

8.30 - 9.00	<i>Registration</i>
9.00 - 9.20	<i>Opening of the Workshop</i> - STU and ICS-UNIDO Representatives - Greetings of Representatives of the Italian Embassy and the UNDP Office in Bratislava
9.20 - 9.40	<i>Miertus S.:</i> Presentation of ICS-UNIDO Programmes and Activities
9.40 - 10.00	<i>CoffeeBreak</i>
10.00 - 12.00	<i>Trifiró F. (Bologna):</i> Overview of New Processes
12.00 - 14.00	<i>Lunch</i>
14.00 - 16.00	<i>Margitfalvi J. (Budapest):</i> Selective Hydrogenation
16.00 - 17.30	Discussion (Moderators: Trifiró F. and Margitfalvi J.)

Tuesday 29.9.1998

9.00 - 10.30	<i>Clerici M. (Milano):</i> Catalytic Oxidations over Redox Molecular Sieves, Scope and Limits
10.30 - 11.00	<i>Coffee Break</i>
11.00 - 12.00	<i>Gallezot P. (Villeurbanne):</i> Redox Catalysis
12.00 - 14.00	<i>Lunch</i>
14.00 - 15.00	<i>Gallezot P. (Villeurbanne):</i> Redox Catalysis - cont.
15.00 - 17.30	Presentation of Country and Institutional Reports

Wednesday 30.9.1998

9.00 - 10.30	<i>Hanika J. (Praha):</i> Reactor Engineering in Fine Chemical Production
10.30 - 11.00	<i>Coffee Break</i>
11.00 - 12.00	<i>Figueras F. (Villeurbanne):</i> Catalysis by Solid Bases
12.00 - 14.00	<i>Lunch</i>
14.00 - 17.30	Excursion in R & D Facilities

Thursday 1.10.1998

9.00 - 10.30	<i>Figueras F. (Villeurbanne):</i> Catalysis by Solid Bases - cont.
10.30 - 11.00	<i>Coffee Break</i>
11.00 - 12.00	<i>Kaspar J. (Trieste):</i> Three-way Catalysts for Automotive Pollution Control: State-of-Art, Perspectives and Challenges
12.00 - 14.00	<i>Lunch</i>
14.00 - 17.30	Presentation of Problems and Case Studies by Participants from the Industry

Friday 2.10.1998

9.00 - 10.30	<i>Wichterlova B. (Praha):</i> Catalysis over Molecular Sieves
10.30 - 11.00	<i>Coffee Break</i>
11.00 - 12.00	Discussion on possible common initiatives on catalysis in Central and Eastern Europe
12.00 - 14.00	<i>Lunch</i>
14.00 - 15.00	Discussion and evaluation of the workshop <i>Conclusion of the Workshop</i> (S.Miertus, ICS-UNIDO)

Annex IV
CERTIFICATE

International Centre for Science and High Technology of the United Nations Industrial Development Organization

Trieste, Italy

in cooperation with

Slovak University of Technology, Faculty of Chemical Technology

Bratislava, Slovakia

CERTIFICATE

This is to certify that

Chornaja Svetlana

has participated in the Workshop

" New Catalytic Systems and Processes in the Small and Medium Enterprises "

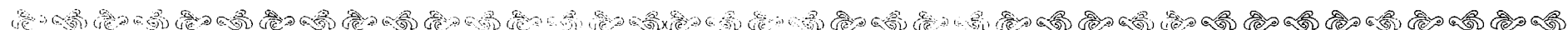
held in Bratislava September 28 - October 3, 1998

Prof. Milan Hronec

FCHT - STU

Prof. Stanislav Miertus

ICS – UNIDO



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Prepared by: Prof. Milan Hronec

Faculty of Chemical Technology

Slovak University of Technology

Bratislava

Slovak Republic

October 1998

In accordance with the Contract No. 98/205 the Faculty of Chemical Technology, Slovak University of Technology in Bratislava, Slovak Republic (The Contractor) provides all the services described in the Terms of Reference dated 10 July 1998.

On the bases of the Contractor's invoice sent to UNIDO Vienna the Contractor received on account No. 2829000124 Bank Code: 1100, Tatra Banka the sum of 24 000 US\$ (twenty four thousand US Dollars). From this sum were payed the expenditures summarised in Table1.

Item	US\$	SKK	Total US\$	Document No.
Travel expenses for lecturers	4.690	590	4.707	1
Travel expenses for foreign participants	1.277	2.082	1.337	2
Travel expenses for domestic participants		1.990	57	3
Accommodations+breakfasts for lecturers		52.852	1.511	4
Accommodations+breakfasts for foreign participants		41.217	1.179	5
Accommodations+breakfasts for domestic participants		3.435	96	6
Meals ¹		93.738	2.680	7
Total	5.967	195.904	11.567	
Balance			12.433	

Exchange ratio Slovak Crown (SKK) / US\$ 34.985

¹ Lunches, dinners and coffe and tea for all leacturers and participants

Since we have succeeded in obtaining very cheap accommodation for all participants and travel expenses for 3 lecturers (from Hungary and Czech Republic) were also very low, the total expenditures of the Workshop charged to the contribution of UNIDO were only 11.567 US\$. This sum is much lower than was planned (30.000,-) for providing all the services connected with the organization of the Workshop „New Catalytic Systems and Processes Applicable to Small and Medium Enterprises“.

Enclosed: Documents No. 1 - 7