

FINAL REPORT

I	The Name of the Institution to be evaluated	<i>National Institute for Research and Development in Chemistry and Petrochemistry - ICECHIM</i>
II	Evaluation Period	2 – 3 October 2012
III Members of the Team		
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The final report contains:

1) Conclusions and recommendations

ICECHIM Evaluation and Site Visit

October 2nd -3rd, 2012, Bucharest

Before going to the conclusions related to the evaluation as such, the committee would like to warmly thank the director general, the scientific director, the heads of all research teams and the staff of ICECHIM for a very efficient and transparent organization of this two days visit. The discussions were held in an interactive and open spirit and we have had access to all documents and were able to visit all equipment and infrastructures of relevance.

To summarize our evaluation labelled "A (4.40)", the committee would like to stress the evolution and level reached by the institute. This assessment is justified by the following conclusions:

- the impressive modernization of the infrastructure which is an unfolding process
- the quality of research in a number of teams dealing with applied biology and chemistry; this opinion is supported by the quality and quantity of scientific publications and contributions to international conferences of that teams
- the proper mixture of young and experienced researchers which bring the average age around 45 years
- the focusing of research towards niche applicative science, for better serving the local industry

Based on these achievements, it is of importance that the following recommendations are considered in the near future:

- a significant increase of the international visibility by significantly improving the scientific production published in highly ranked journals

- a re-shaping of the patenting policy (for protecting fields, not items) by using the services of professional advisers on IP protection
- a concentration of the researchers into key research teams placed under the leadership of personnel with proven scientific track-record
- the quality of training the young researchers should be improved by succeeding habilitating senior researchers for supervising doctoral works in house.

2) Observation related to the evaluation of each research team (N=12 Teams)

Advanced Polymer Materials and Polymer Recycling (E1)

The team of advanced polymer materials consists of thirteen members covering a broad field ranging from supramolecular chemistry to renewable materials. The research team re-shaped itself shifting the focus over the last decades from synthetic fibres towards modern area of advanced polymer materials. This may be also the result of the vanishing of local synthetic fibres industry.

The age structure of the team shows a very good trend over the last five years, with more than a third being below 35 years old. It shows that a generation change is ongoing in the group and suggests that the research directions will be more focused in the future. Positive is that the young people acquired international experience by spending stages in Western laboratories. This speaks also about the international contacts and visibility of the group leader and helped the team to be involved in international projects.

The quality of the infrastructure is also viewed as a strength of the team, which appears to be equipped to the required standards for the purposes.

Against a poor demand of local industry the team addresses successfully public funds from research programmes of local research agency, as well as from international – EU, or bilateral – programmes. There is also a visible effort in patenting results and transferring technologies, an effort which has to be included in a general patenting policy of the Institute.

The large amount of projects is perceived still as dispersing the research power of the group and we advise for more focusing of the research directions.

The number of publications and citations is still low, related to the amount of qualified researchers of the team, and the journals are not of the high quality group of polymer field. However one notices the steady trend over the last 5 years for increasing the participation of the team members to the international flow of information exchange. In conclusion it can be certified that the research team "Advanced Polymer Materials and Polymer Recycling" (E1) is making impressive progress in catching up with international standards. Its present performance may **be rated between "good" and excellent.**

Alternative Bioresources and Biorefining (E2)

Members of this research team focus strongly on sustainable technologies. One of the main research lines of the group is the exploitation of algae, a modern and hotly debated topic. The equipment is to the international standards and well organised in modern laboratories. The team is engaged in an activity which focuses on the technological development and processing, with a large scale project (CO₂ mitigation from greenhouse gases) unfolding as following the laboratory results.

Like with most of the groups of the Institute there is a good mixture of young and experienced researchers, and the team is still looking for hiring new scientists. Positive is that the young people are involved in the work of project acquiring which allows them gaining this way a necessary experience. Also as a strength the people of the team are well motivated and have international experience from stages abroad through their international programmes.

The scientific activity of the team is, still, poorly expressed in international publications, with an output of only 2-3 papers yearly in low impact factor journals. This is an issue which should be addressed in the immediate future.

We view the team research present performance as **rated between “good” and “excellent”**.

Antifouling - Elastomers – Resins (E3)

This research team appears heterogeneously organised. While the antifouling is a modern topic, the elastomers and resins are rather general lines.

Antifouling direction of research appeared well focused but somehow as a single-person work. The work of assimilating the international standards of the antifouling is carried out also within the frame of this direction. The transfer of the results of these researches is of potential interest for coating companies and should be amplified.

The other two directions, elastomers and resins, respectively, are addressed by classical approaches, with incorporation of few noticeable developments.

The leadership of the team needs to be strengthened for improving the collaboration between the members and possibly focusing more on the successful direction.

The scientific visibility of the team is reflected mainly by the number of patents, indicating the strong technological focus of their researches. The papers over 5 years are quite modest for a team of 9 scientists (18 papers) but it should be noted that half of them were in the last 2 years, indicating a desirable increasing trend.

Overall we rate the team research present performance as **“good”**.

Bioactive Compounds (Bioproducts) (E4)

This research team looks having a very clear and modern designed research programme. The team leader succeeded to attract and motivate a good number of young students, which forms a clear strength.

The infrastructure is to the international modern standards and laboratories are suitably equipped for the running programmes. The team members and the research lines are well connected with the other research teams working in the field of “bio” (E2, E5, E6, E8).

The research strategy is designed to support the development of the local small and medium enterprises, specific to Romanian industrial environment, which gives to the research team a strong position. This is also noticeable from the structure of the attracted funds, the research team having direct projects with local partners which shows that the research line appeals the local industry.

In fact the team focused itself on transfer of knowledge and technology and its scientific output is reflected mainly in the number of patents, rather than papers in journals (only 15 papers over last five years for 9 scientists).

The research team present performance may **be rated between “good” and “excellent”**.

Biofuels and Fuels Additives (E5)

The research direction is quite recent and the team is, consequently, relatively newly formed. The research programme is very pragmatic and well-adapted for the local specific of the industry. This is reflected also by the amount of funds attracted from private companies from direct contracts, and positions the team as an important source of technologies and know-how for SMEs.

The team comprises a good size (more than two thirds) of young scientists (MSc and PhD students) who, as a second positive point, appeared to be well informed and very communicative.

The laboratory is reasonably well-equipped for the purpose.

Like with many other teams, the scientific output in highly ranked journals is also lacking, but it is noticeable the increasing trend over the last 3 years for submitting papers to peer-reviewed journals.

The research team present performance may **be rated between “good” and “excellent”**.

Biotechnology and Bioanalysis (E6)

The research team of “Biotechnology and Bioanalysis” proved to be very knowledgeable, with a clear and precise designed programme activity.

The quality of the infrastructure of the laboratories is a strength of the team, the equipment being to the modern international standards.

Also a strong point is the amount of young people in the team (4) and the fact that they are very well informed and motivated. Among others the young people are involved in drafting the project proposals, which provides them the required self-confidence and secure the team with the next generation of capable scientists. The members of the team have stages in international laboratories, and this is reflected in the research programmes and the spirit of the team.

There is a strong interest in the dissemination of the scientific results. The team has a good production of papers in peer-reviewed journals, and is involved in writing standards for specific assessments, which indicates the good scientific visibility of the members. The senior researchers are also members of the committees for PhD, master and BSc thesis at University, allowing them to select and attract fresh students to their team.

The team leader has a good, modern mentality, bringing the team close to the international ones of the field.

The research team present performance may **be rated “excellent”**.

Colloids and Surfaces. Industrial and environmental applications (E7)

The team of "Colloids and Surfaces" carries-on two activities, namely of research and of analytical testing. The research line of the team does not look keeping the pace with the today directions of the colloid science. Particularly the team seems to do not have an activity for synthesis, which makes the activity to be limited to verifying the applications / formulations of given products.

The infrastructure of the laboratories seems to be not modernised for some years, and some up-grades and investments are required for making this research team competitive.

On the other side, from the point of view of analytical unit, the laboratory is certified and considered as the reference one for the analysis of surfactants and is solicited by many customers. As a result the team obtains good amount of the funds from direct sources.

The young people of the team makes almost a half of it, which is a positive argument for the future of the team.

The scientific production of the team is concentrated too much in local journals; consequently the visibility of the team suffers from lack of papers in highly ranked journals.

Overall we rate the team research present performance as **"good"**.

Eco – Friendly Multi - Phase Materials (E8)

The activity of the team “Eco-friendly multi-phase materials” is, in some respects, complementary to those of research team “Colloids and surfaces” (E7).

The team is quite small, with senior researchers on permanent positions and PhD students hired on temporary base. This gives a certain flexibility to the team, but does not allow to develop strategic research lines.

The team is oriented extremely applicative, but less inspired in choosing the research programmes.

The visibility of the team is good, although one may notice the same predominance of low ranked journals like for other teams.

We may rate the performance of the team as **“good”**.

Heterogeneous Systems (E9)

The research team of “Heterogeneous Systems” is a well-shaped team around a strong leadership, with a clear view of the present and the prospective future, at international standards.

The infrastructure is up-to-date, the laboratories are well-equipped for purpose and the quality of work is very good.

The young people are well motivated, with stages in international laboratories, which make them valuable assets. The process of hiring continues, showing that the team works on research programmes of high potential.

The team attracts important EU funds in various programmes, indicating it is included in a strong international network of European laboratories.

The scientific production of the research team is impressive, the papers are submitted to highly ranked journals and this, together with the capital of young people, secures a solid future to the team.

We rate the performance of the research team as “**excellent**”.

Multifunctional Materials for Advanced Technologies (E10)

The research team made a good impression, with works on various interesting projects, but they seem to lack coherence.

Infrastructure is appropriate for the targets of the research projects and the staff is knowledgeable, which makes the team to approach successfully numerous projects. On the other side, the large amount of the projects may give the impression of the dispersion.

There are 2 young people (PhD students) in the team, but still the mean age of the team is quite high and requires consideration from the team leader in view of long term prospective.

The scientific visibility of the team is quite good, with publication in good journals usually in collaboration with members of team of "Heterogeneous Systems" (E9). This is a situation which should be improved.

We rate the performance of this research team as **"good"**.

Nanomedicine (E11)

The research team of “Nanomedicine” is quite small and works on an extremely attractive and very modern topic, addressed professionally at high standards.

The infrastructure is excellent and exploited appropriately.

The team leader, having also a university position, has the possibility to attract young researchers, while supervising for PhD degree. This way the team has a large pool of resources for a change of generations.

The team has a very good international visibility, producing papers in highly ranked journals and contributing to books published by strong publishing houses. The applicative side of the researches is also addressed by numerous patents, including international ones.

We rate the overall performances of this team as **“excellent”**.

Polymer Composites and Nanocomposites (E12)

The research team is well oriented towards clear targets, following a well-designed research programme. Among the results the team succeeded to create the reference materials for an EU project, which grounded the basis for acquiring another one.

The people of the team are well-motivated and knowledgeable, being a proper mixture of junior and experimented researchers.

The infrastructure is modern and well exploited, allowing the team to carry on successful projects. The scientific production is significant and the international visibility of the team is good.

We rate the performance of the research team as **“excellent”**.

3) Justification of the mark awarded for each of the 5 criteria, highlighting strengths and weaknesses in accordance with the minutes / report of the visit

C ₁	The quality of R&D activities and their results	4
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The number of publications is not very high and most of them are published in Romanian journals. Those submitted to ISI journals are mainly in low to average ranked journals. This situation needs to be changed and the number of publications per researcher needs to be increased. In fact this was noticed as being the trend of the last 2 years, indicating the staff is aware and took means for improving.

The Institute has a clear orientation towards applicative science and the patenting is recognised as an important target and is present at different levels in the dissemination activity of all team groups. The Institute lack still a patent strategy which should be build up for protecting area of their research, not only punctual results.

The activity of patenting internationally is only at very beginning, but there are significant efforts in the good direction. It has to be also considered that the patenting internationally is a costly operation and here is required the involvement of a national initiative.

The funding of the Institute is at a satisfactory level, with a reasonable mixture of private and public funds attracted. There are also noticeable successes in attracting international funds.

The Institute is only at the beginning of creating spin-off companies. In fact the first experiment was initiated in this year. It is, therefore, too early to evaluate this point, but the Institute is obvious on the right track.

It has also to be mentioned the large participation at conferences and symposia, locally and internationally, as well as the organisation of a yearly symposium at Institute.

Summing up, the Institute is on the proper trend toward catching up with the similar Institutes in Europe and in the world. The strength of the Institutes is the significant participation in EU projects and the acquisition of good funds. As a weakness is the activity of publication, and of patenting. Particularly for patenting it would be advisable to ask for consultation to improve the IP protection.

C ₂	Human resources Quality	5
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Considering the broad spectrum of activities running in the Institute the human resources are quite uniform. The majority of the teams meet good standards, and some of them are excellent in this respect.

The average age is good and the attraction of young qualified researchers is a very promising and strongly implemented policy. There are bureaucratic difficulties for attracting foreign researchers to work in the Institute, as suggested by one of the research team, and these have to be addressed by national policy in the field.

The ratio of R&D staff to administrative staff is appropriate for the scope.

In average there is a good policy on human resources and the Institute gain many young people, which is perceived as a strength.

There is a lack of doctoral supervisors in the Institute, which is appreciated as a weakness. In this respect it is advised to have senior researcher habilitated for running directly the doctoral programmes in the Institute.

C ₃	Quality infrastructure and its rate of exploitation	4
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The infrastructure quality is quite widely spread; generally it is good for performing meaningful researches, but it requires significant changes in some cases.

There is an impressive amount of modern equipment, which is well exploited at around 80%. It is also noticeable a good policy of updating the infrastructure.

The strength of the Institute is that it possesses the required spaces for accommodating new equipment. The weakness is that these spaces are not all modernised. We found that the example of the laboratories of microbiology and bioreactor are to be followed in this respect for bringing the quality of the infrastructure at the international level.

C₄	Management efficiency and quality of the research environment	5
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As far as we could see, there is a general positive motivation among the staff of all the teams, which is likely due to the large autonomy in research and in handling their own budget. The rules of evaluation of the staff appear to be clear and transparent.

The administrative procedures, as far as they have been explained during interviews, are well in place and under a constant evaluation of ISO 9001.

Judging from the amount of young people kept in Institute there should be a good spirit of work and overall the R&D staff appeared satisfied and content.

We did not get any complain during the discussions with the personnel concerning the transparency of the decisions, and we understood that all senior researches level 1 and 2 are directly involved in decision making. Also there were no critics to the administrative and auxiliary staff.

The Institute have implemented the EU standards concerning the ethics and good behaviour and during the 2-day visit we did not see anything to contradict it. Consequently we consider that all the activities occur according to the European and International best practices.

Summing up, we found a good and efficient management with a good team spirit. There is a lack of representation of young people in the managing board and we consider that it is advisable to invite young representatives to attend board meetings, for better conveying the board messages.

C₅	Quality and credibility of the institutional development plan	4
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The Institute went through a long process of restructuring. The development of biomaterials and biotech processes are strong examples of good directions towards new and modern goals and opportunities.

The intention, advocated by few groups, of working for niche applied science, is a right decision within the framework of the local industrial environment.

The recruitment policy follows largely the international standards, being focused on attracting and stabilising of future project leaders by a partly successful brain drain return to Romania of young scientists.

The collaboration of the research teams of the Institute with national bodies looks very strong, while the international collaboration should be extended across the whole Europe.

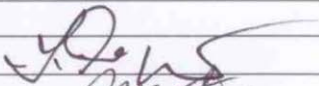
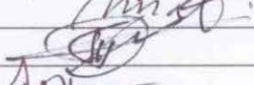
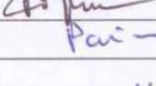
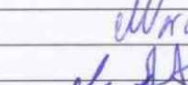
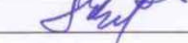
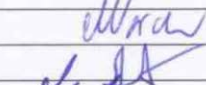
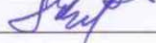
The planning of scientific communications sounds reasonable, but the major projects of the Institute missed to be depicted.

Regarding the critical mass, the impression is that the human resources are equally distributed among the teams, and this may, possible, weaken certain area. In the future it should be addressed properly specific requirements to enhance the impact of key teams.

Concluding there is a credible, but not enough ambitious institutional plan. The direction towards niche applied science is a strength, while the dispersion of personnel among all teams is perceived as a weakness. The staff should be concentrated in teams with ambitious targets, particularly around the EU projects.

4) Overall technical considerations

The average score of the Institute for the 5 main criteria reaches **4.40**, which corresponds to the upper end of the certification **level A** (3.5 – 4.5). According to the instructions of the Ministry this falls between “Good” (institution has made significant efforts in this direction, with solid results. Areas of significant improvement remain, but the development plan attacks them in a coherent and plausible way) and “Excellent” (compatible with an institution with world-class performance). We find that the Institute came through a difficult process of restructuring which is not yet ended, but whose results are already visible in a modern look of most of the research teams. We suggested measures included in the specific recommendations. As an overall consideration we find that the added value of gathering 12 research teams in one Institute needs, yet, to be demonstrated and put into real value, and this requires more ambitious scientific goals.

Nr. crt.	Name, Surname	Signature
<i>Evaluation TEAM</i>		
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2	Evaluator 2 – Viorica Domnica MUSAT	
3	Evaluator 3 – Todor DELIGEORGIEV	
4	Evaluator 4 – Crisan POPESCU	
5	Evaluator 5 – Csaba PAIZS	
<i>Observers</i>		
1	Coordinating Authority – Mariana VOICU	
2	CCCDI Representative – Lucian PINTILIE	
3	ANCS Representative – Simona MĂLUREANU	

Proposed certification level: A (average score = 4.40)

14 November 2012