



Statement from the director of the institute on the final report of the Commission No. 4

In my opinion the Final Report of the Commission correctly and faithfully describes the current situation in IMC and addresses main problems of the five evaluated teams, which in our case represent the entire institute. The comments and recommendations the commission has made in its report reflect the way how the same issues are viewed by an independent observer from the outside. I greatly appreciate this reflection as a very useful input and, therefore, on behalf of IMC **I do not request any amendments to be made to the Final Report.**

The following comments to the Final Report just try to explain or additionally specify some of the key issues that have been discussed during the on-site visit of the Commission and are mentioned in its Final Report.

Publication strategy, visibility and “trendsetting”

The commission acknowledged our publishing in journals specific for our fields of research, naming specifically *Macromolecules*, *Biomacromolecules*, *Soft Matter*, *Langmuir*, etc. We are pleased to see that, because the above titles represent the top journals of *polymer science* field according to JCR, with *Macromolecules* ranked No. 1, *Soft Matter* No. 2, *Biomacromolecules* No.4, *Polymer* No. 6. (See copy of JCR listing in Table 1). Majority of our publications appears in the journals of the 1st Quartile of *polymer science* category.

To put it shortly, the IMC mission is to perform research, both fundamental and applied, in *polymer science*. We are publishing primarily to communicate our findings to that part of scientific community, which is working in this particular branch of science, i.e., polymer science, so that the researchers in that field can knowledgeably read, appreciate and use our results. We encourage our researchers to publish in top journals of polymer science field, such as *Macromolecules* for papers of general interest to polymer scientists, *Biomacromolecules* for papers presenting macromolecular concepts outreaching to biology or biochemistry, *Langmuir* for works dealing with interfacial phenomena, and so on. Obviously, for example, the works dealing with degradation of polymers, either from the point of view of their stability or polymer recycling technologies, are directed to *Polymer Degradation and Stability* journal, because this journal represents the primary forum for these topics, although the IF of the journal might be considered just *about average*.

We don't wish to underestimate the importance of publishing in high prestige journals, such as *Nature* or *Science* for visibility and trendsetting in science *in general*, and we also recognize how important such publications are in the process of evaluation of research institutions. On the other hand, it might be worth of noticing that out of 4924 of papers (Articles and Reports) published in *Nature* in the period of 2010 – 2014, only 40 – 45 articles (about 0.8 %) was dealing with polymers or had some relevance to the polymer science field. Of course, we would like to participate on this 0.8 %. In this respect, the mechanisms that should stimulate publishing in high prestige journals with more general impact has already been installed by IMC management already in the last year, effective of January 1, 2015, as a part of our internal team/individual evaluation system. We believe that in a long term these measures will help to improve competitiveness and visibility of IMC on the international scene.

Adoption of advanced polymer synthesis

The commission acknowledges our using of the state of the art methods of synthesis, mentioning “*different variations of click chemistry*”. We would like to add, as it was shown in the presentations of the BIOMOL and SUPRAMOL centers, that in addition to click reactions we use regularly advanced methods of controlled polymerization, such as ATRP, RAFT and variations of them to design well-defined polymers and complex supramolecular structures that can achieve specific biological effects. Yes, mastering these synthetic techniques is not unique to our Institute. There are also other laboratories around the world, which use these most advanced methods. On the other hand, only top level labs use them to design tailor-made macromolecular constructs and biomaterials. Those who are working in the field might be aware that vast majority of papers published every year in the area of biomedical materials resigns just to using or modification of traditional or commercially available polymers. It is the capacity of the IMC teams to design and prepare polymers and supramolecular constructs tailored to elicit specific interactions in biological systems or designed for a particular biomedical application, what makes the BIOMOL and SUPRAMOL teams so attractive for numerous cooperative projects with biological and medical laboratories these teams have both in Czech Republic and abroad.

Focusing the research themes

The need for focusing of research on fewer topics is repeated several times in the Final Report of the Commission. In general, I agree with that recommendation and see this issue as one of the most important and permanent tasks for the institute management. Following are just few comments on this note.

In their presentations the team leaders focused primarily on showing scientific results they considered to be the most significant for their contribution for advancement of polymer science. Our five evaluated teams, BIOMOL, SUPRAMOL, MATER, STRUCTURE and OPTOEL, represent entire institute. Taking into account the size of the teams, in some cases comparable with the size of some smaller institutes of AS CR as a whole, and, consequently, the amount and scope of the results obtained during five years on one hand and the limited time allocated for their presentation on the other, it might easily happen that the Commission perceived that as being too many topics.

In this respect, the Commission pointed out that “*large number of grants with limited finances each requires too much time-consuming management*”. This is true, however, the limitation on grant finances are set by grant providers and the funding policies are rather out of our influence. In the situation when more than 50 % of the institute budget has to be derived from many relatively small grants and/or contracts on specific projects, and taking into account the overall grant success rate, the team leaders must explore all options for securing research funding to keep up with their responsibility for the teams.

The management of IMC is aware of the spontaneous tendency to fragmentation of the research effort, which such funding system in CR causes. The awareness of this problem has been mentioned in the presentation of the Director as well as the measures we take to cope actively with this tendency. The coordination of the research themes and focusing the topics of grant projects to fit into the most significant directions, which are represented by the centers (BIOMOL, SUPRAMOL, MATER, STRUCTURE, and OPTOEL) has proved to be actually quite efficient tool to do that. I appreciate that the Commission acknowledged this effort positively.

As a matter of fact, looking at the presented results with closer insight into methodology or materials aspects of investigated problems, one may perceive that the research effort can be quite well focused within the centers. For example, controlled polymerization techniques used in BIOMOL for creation of biomimetic surfaces of biomaterials or biosensors are analogous to those used for designing polymer-drug conjugates or diagnostic particles. Therefore, sharing of

knowledge, methodology and materials among individual groups within the BIOMOL center substantiate the “common interest” and helps to steer the effort in chosen direction, without respect whether the keywords of individual projects realizing this effort are in some cases related to polymeric drug delivery or diagnostics and to biomaterials, biosensors or hydrogels in others. Similarly, the SUPRAMOL center devotes most of its activity to designing and producing self-assembled systems while using the same physicochemical principles. Analogous unifying features are adopted in other centers as well.

Specific comments to the research teams

MATER: The Fourier Transform Rheology (FTR) has been applied in the MATER centre only marginally so far. Our recent publications (Strachota et al.: *Soft Matter* 11: 9291, 2015, Ponyrko et al., *Polymer* 54: 6271, 2013) used FTR for chemorheology investigations, following the material structure evolution during the reaction. The rheology group has recently weakened by the retirement of its two key researchers. To support the rheology studies in the MATER center, the rheology group is under reorganization already and new leader with 12 years of rheology career in University of Erlangen has been appointed, taking advantage of the Purkyně Fellowship program of the Czech Academy of Sciences.

The committee raised a question about prospects and practical significance of microwave-assisted technology of polyurethanes (PUR) recycling in a large scale. The recycling technology for PUR waste was evaluated by us in a semi-scale (80 liters) microwave-heated batch reactor. The tests proved 3.7 times reduction of polymer degradation time by using our process with respect to other technologies. Because the energy consumption represents a bottleneck of recycling technologies, this energy reduction is considered to be very significant. Currently, our patent on PUR recycling technology is licensed to a Czech investor and his pilot plant with annual capacity of 3500 metric tons of the recycled polyol is now under development.

STRUCTURE: Solid-state NMR spectroscopy becomes increasingly important for structural characterization of various types of materials studied by other IMC teams. We agree with the committee that keeping the world standards in these studies would require significant investments into the high-field-ss-NMR equipment. We plan to pursue a coordinated activity with other institutes of AS CR interested in these techniques, towards establishment of a joint ss-NMR facility.

OPTOEL: In this center the need for focusing of research on fewer topics is particularly relevant. The competition is high in this field, as these timely topics attract lot of attention in academia and, at the same time, the progress in application area is very fast, being driven by big industrial research capacities. At the level of Director and Council of the Institute, as a part of regular internal evaluation the discussion on refocusing of the research themes in OPTOEL already started in 2014, followed by reorganization and personal changes in the positions of group leaders, effective of November 2015. The outcomes and prospects of the OPTOEL center following these organizational changes are scheduled to be evaluated again at the end 2016.

22. January 2016

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Director

Table 1: 1st Q journals of polymer science category according to JCR

**Journal Data Filtered By: Selected JCR Year: 2014 Selected Editions:
SCIE,SSCI Selected Categories: 'POLYMER%20SCIENCE' Selected
Quartiles: Q1, Selected Category Scheme: WoS**

Rank	Full Journal Title	Total Cites	Journal Impact Factor	Eigenfactor Score
1	MACROMOLECULES	101,504	5.800	0.120180
2	Soft Matter	27,131	4.029	0.101520
3	JOURNAL OF MEMBRANE SCIENCE	45,13	5.056	0.060350
4	BIOMACROMOLECULES	31,769	5.750	0.054870
5	CARBOHYDRATE POLYMERS	30,889	4.074	0.050810
6	POLYMER	54,164	3.562	0.050200
7	JOURNAL OF APPLIED POLYMER SCIENCE	47,314	1.768	0.049120
8	PROGRESS IN POLYMER SCIENCE	19,454	26.932	0.031590
9	Polymer Chemistry	10,407	5.520	0.030840
10	JOURNAL OF POLYMER SCIENCE PART A-POLYMER CHEMISTRY	23,291	3.113	0.029160
11	MACROMOLECULAR RAPID COMMUNICATIONS	13,256	4.941	0.022820
12	POLYMER DEGRADATION AND STABILITY	16,208	3.163	0.017980
13	EUROPEAN POLYMER JOURNAL	14,393	3.005	0.016480
14	SYNTHETIC METALS	14,376	2.252	0.014390
15	ACS Macro Letters	3,481	5.764	0.013890
16	JOURNAL OF POLYMER SCIENCE PART B-POLYMER PHYSICS	13,161	3.830	0.013320
17	MACROMOLECULAR CHEMISTRY AND PHYSICS	9,868	2.616	0.011690
18	MACROMOLECULAR BIOSCIENCE	5,749	3.851	0.011470
19	CELLULOSE	5,929	3.573	0.009940
20	POLYMER INTERNATIONAL	6,672	2.409	0.009060