Dear Professor Al-Dahhan:

We are very willing to collaborate with you on the international collaboration proposal for research and education entitled “Catalytic Nanofactories to Industrial Processes: An International Collaboration”. We will be also happy to host students, faculty, scientists and engineers from Iraq and other countries and collaborate on the research areas of the proposal. We will be very much interested to disseminate the results and findings along with your education program and with the collaboration of St. Louis Science center.

The Semenov Institute of Chemical Physics (SICP) is one of the biggest research institutions in the Russian Academy of Sciences. Its research activity covers a broad area of chemistry, physics and biology and is mostly focused on the studies of physical principles governing chemical processes. Heterogeneous catalysis and related areas of materials science, theoretical physics and chemical engineering are traditionally among the main research fields in the SICP. The Laboratory of Heterogeneous Catalysis (LHC) is the biggest research unit in the SICP, its permanent scientific staff consists of about 30 members. The main areas of scientific interests in the LHC are:
- oxidative transformations of hydrocarbons (first of all, light alkanes),
- surface chemistry of metal and oxide catalysts,
- solid state chemistry of oxide materials,
- non-steady state kinetics of catalytic reactions,
- heterogeneous reactions of free radicals.

Besides an equipment for preparation of catalysts and a series of installations for their testing, we possess of several unique methods, such as in situ IR spectroscopy, matrix-isolation EPR spectroscopy for studies of free-radical processes, ultra-high vacuum TPD-TPR setup with MS analysis, TGA-DSC-MS complex. In the LHC a high-temperature in situ Differential Scanning Calorimetry (DSC) has been developed. This technique provides with unique information on thermochemistry of reacting systems, including non-equilibrium states of catalyst surface and bulk.
It should be emphasized that the in situ DSC is a technique complimentary to the Temporary Analysis of Products (TAP) ideology that has been invented and very successfully developed by Prof. John Gleaves and his colleagues at the Washington University. We appreciate very much fruitful contacts we have had with Prof. Gleaves previously and hope that our joint efforts can lead to new serious progress in the understanding of dynamic behavior of catalytic systems. Also, we are well aware of advanced methods of analysis of non-steady state processes and results of transient-response experiments developed by Prof. Gregory Yablonsky. We will be happy to collaborate in this area and to suggest new fields of application and further development of the above approaches.

The SICP and the LHC in particular have participated in a number of joint research programs on international level, including those funded by various foreign and international institutions and foundations (ISF, CRDF, INTAS, INCO Copernicus, etc.). We have successfully collaborated with many research centers, laboratories, and universities in the USA, European Union, Japan and other countries.

We believe that publication of results of our collaborative work will be of substantial interest for the scientific community and industry. We will work to seek financial support from our country to exchange visits with the members of the international collaboration.

Sincerely Yours,

Prof. Alexander A. Berlin  
Director of SICP

Prof. Vladimir N. Korchak  
Head of LHC