

**Report about research stay at Leibniz Universität Hannover (LUH),**  
**Institut für Elektroprozesstechnik (ETP)**

Vanina Polina, postgraduate student of Peter the Great St.-Petersburg  
Polytechnic University (SPbPU)

I am PhD student of Institute of physics, nanotechnology and telecommunications of Peter the Great Saint-Petersburg Polytechnic University. My general fields of interests is ferroelectrics, nanostructures, nanocomposites, low-dimensional systems. I was in Leibniz University of Hannover for research stay in April 2016.

One of the objects of our research is nanocomposite materials of new type based on magnetic micro porous alkali borosilicate glasses. Production method developing in collaboration of our laboratory and laboratory of Thermische Prozesse und elektromagnetische Materialbeeinflussung of Institut fur Elektroprozesstechnik is based on induction melting of batch in a graphite crucible which is heated inductively by radiofrequency generator. The bottom and sides of the graphite crucible transfer the heat to the batch.



Studies of glasses prepared by this method confirm the phase separation on a chemically unstable phase and stable skeleton. First one is presented by the dendrite-like structure of interconnected channels that is a necessary condition for porous glasses production. A skeleton consists of silica with iron-rich agglomerates. Using independent carbon markers it is shown that the uniform distribution of initial components is provided at melting due to convection and electromagnetic agitation. On the basis of obtained results we have optimized the melting regimes and thermal treatment of ferriferous glasses with magnetic properties. These results open a possibility to produce the porous magnetic matrices and multifunctional nanocomposite materials with co-existing ferroelectric and magnetic orderings with developed interface based on these porous glasses.

Also I would like to notice that working process is organized on very high level, I had an individual comfortable place for work. I met a lot of great and helpful people, which can give all necessary information and I had not any difficulties with the language barrier: I don't know German language at all, but it didn't become a problem, because at LUH all workers speak English very well. Regarding of cultural aspect of my travel I found Hannover to be very nice and peaceful city with interesting architecture and wonderful atmosphere of German city. This time I have visited amazing Botanical Garden.

