

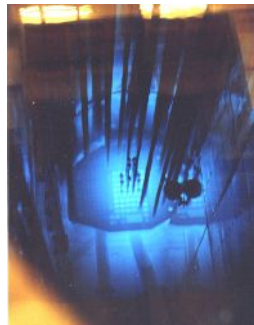
Nanostructures in constructional materials of nuclear reactors

Operating capacity of nuclear reactors structural materials, exposed to neutron irradiation, is to a great extent predicated upon morphology and concentration of irradiation-induced nanostructures. Such irradiation-induced phases as copper-enriched precipitates and other structures make the main contribution to irradiation embrittlement for the material of VVER-440 reactor vessels. Composition of secondary phases for the material of VVER-1000 reactor pressure vessels, which have another alloying basis, significantly differs.

In this report there are considered the main effects of radiation-induced nanostructures influence on mechanical properties of materials, methods of their directed transformation, resulting in materials properties recovery and their operating capacity. RRC “Kurchatov Institute” experimental capability, implemented in nanostructures research, and its development prospects are presented in the report.



Neutron physics facilities hall



IR-8 research reactor provides unique experimental abilities to carry out investigations in the field of condensed matter physics, nanotechnologies and nanomaterials, radiation and reactor material science, nuclear physics and so on.