



JOINT INSTITUTE FOR NUCLEAR RESEARCH

Factory of Superheavy Elements

Cutting-edge experiments on the synthesis of new elements have been conducted at the accelerator complex of the Laboratory of Nuclear Reactions (LNR) JINR since its foundation up to the present. 5 new superheavy elements that close period seven of the Mendeleev Table have been discovered for the last 20 years. Their numbers are: 114 (flerovium), 115 (moscovium), 116 (livermorium), 117 (tennesinne) and 118 (oganeson).

To synthesize heavier elements 119 and 120 and study in detail nuclear and chemical properties of the already known elements it is necessary to increase the efficiency – by ten folds – of the experiments. Further development of this scientific trend is connected with the implementation of the project of the first in the world “Factory of superheavy elements”.

The project includes the construction of the modern experimental building equipped with all necessary engineer systems to provide work with highly radioactive substances, the new accelerator complex DC-280 and new separators.

The basic facility of the Factory of Superheavy Elements is the new cyclotron DC-280. Its parameters in beam intensity of accelerated ions will be one order higher than those that were reached at operating accelerators of the leading centres in the world. At present, most important stages of the factory development have been completed: the experimental building has been commissioned, the assembling and adjusting of the systems of the DC-280 cyclotron have been completed.

The start-up of the cyclotron was held on 25 March 2019. First experiments at the new accelerator complex are planned in the second quarter of 2019. The programme of experiments will be accomplished with broad cooperation with scientists from the USA, European Union states, Japan and China.

The factory will become a world base for future research in superheavy nuclei and serve strengthening of the priority of Russia and all JINR Member States as leaders in the field of the synthesis and studies of properties of superheavy elements.

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