

Report on the “Status of the Factory of Superheavy Elements: Separator, target and detection units”

A complete construction and a successful commissioning of the Superheavy Elements Factory (SHEF) are important conditions to be fulfilled before the beginning of ambitious new program on the synthesis and study of super heavy elements at FLNR.

The development and construction of the SHEF experimental setups, namely of:

- a gas-filled separator for experiments on the synthesis and study of super heavy elements to be installed at the beam line of the cyclotron DC-280 in October 2017;
- a velocity filter “SHELS”, installed and running today at the beam of the cyclotron U-400;
- a simplified version of a gas-filled pre-separator to be used to study the chemical properties of the heaviest elements and precise mass measurements.

The above separators will require a new design of the target system and of new focal plane detectors, which will be used at FLNR in experiments on the synthesis of SHE. A short report on the “Status of the Superheavy Elements Factory” submitted to the PAC should be completed answering the following questions:

Separators:

- 1) *What is the design of the gas-filled separator? What are the plans for its commissioning and when the first experiments are planned to start? What are the specifications and the beam dump design of the gas-filled separator?*
- 2) *Will the SHELS velocity filter be installed at one of the SHEF beamline?*

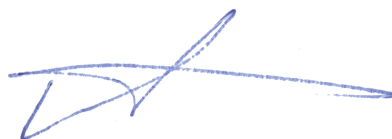
Targets:

- 3) *Please present the efforts undertaken at FLNR to the design thermally and radiation stable targets. What is the foreseen target quality (thickness, homogeneity) diagnostic system?*
- 4) *What is the foreseen program of tests and a timeline for the target development?*

Detectors:

- 5) *What is a schematic design (layout) of the full detection system? Is the DSSSD placed inside the box of additional Si detectors? What are expected efficiencies of the Si and Ge detectors and how they compare to the currently used detectors at FLNR?*
- 6) *What is the timeline for the construction of a full detection system?*

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