SUPERHEAVY ELEMENTS: PRODUCTION AND INVESTIGATION OF CHEMICAL PROPERTIES

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Nowadays, elements up to Z=118 are all known. The heaviest of them, from Z=106 though Z=118 have been produced in recent decades at the leading laboratories of the world such as GSI, Darmstadt, RIKEN, Japan and JINR, Dubna. These elements are all named and many of them are stable enough to allow for measuring their chemical properties. This is done with the use of sophisticated techniques dealing with “one-atom-at-a-time” amounts of these elements.

For such demanding experiments, theoretical predictions are of crucial importance. Thus, in this domain, relativistic quantum chemistry and developed methods are particularly valuable. In the talk, successes of the relativistic theory and its applications for the heaviest elements are presented. Dramatic influence of relativistic effects on the properties of superheavy elements is demonstrated.