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## Application of coprecipitation for the study of chemistry of Rf

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Chemical identification of radionuclides in the decay chains of the recently discovered transactinide elements may serve as a method for confirming the discovery [1]. The longer half-lives of radionuclides of transactinides discovered in the  $An + {}^{48}\text{Ca}$  reactions expands the application of radiochemical techniques for their chemical characterization [2]. The method of cocrystallization can give valuable information on properties of transactinide compounds, not available in the macroscopic, therefore the identification of coprecipitation mechanism of lighter homologues of transactinides is of scientific interest.

Here we report the coprecipitation behavior of Ti, Zr, Hf and Th as lighter homologues of Rf with lanthanum fluoride. The kinetics of coprecipitation and distribution of group 4 elements between the liquid and solid phase, both preformed and formed during the distribution process, was studied as a function of concentration of the micro- and macrocomponent, foreign multivalent ions, HF, pH in solution. The solid phase of prepared samples was characterized by electron microscopy (SEM and TEM). The results show that the coprecipitation mechanism of Zr and Hf with  $\text{LaF}_3$  is different from Ti and Th and can be assigned to heterovalent isomorphism. A possibility of using coprecipitation with lanthanum fluoride for comparative investigation of the behavior of Rf in HF solutions was demonstrated.

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1. S. N. Dmitriev et al., *Mendeleev Communications*. 15, 1, 1-4 (2005).
2. Yu. Oganessian, *J. Phys. G.: Nucl. Part. Phys.* 34, R165-R242 (2007).

**Primary author:** Mr AKSENOV, Nikolay (Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research)

**Co-authors:** Dr BOZHIKOV, Gospodin (Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research); Prof. DMITRIEV, Sergey (Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research); Dr LEBEDEV, Vyacheslav (Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research)

**Presenter:** Mr AKSENOV, Nikolay (Flerov Laboratory of Nuclear Reactions, Joint Institute for Nuclear Research)

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