

INVESTIGATION OF DUBNIUM CHEMICAL BEHAVIOUR. ION EXCHANGE SEPARATION OF GROUP V ELEMENTS.

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Abstract

Chemical behaviour of group V elements in the aqueous hydrofluoric acid solutions was studied. The radiochemical method for the cation exchange separation of Nb (Pa) and Ta from Zr, Hf and lanthanides is presented.

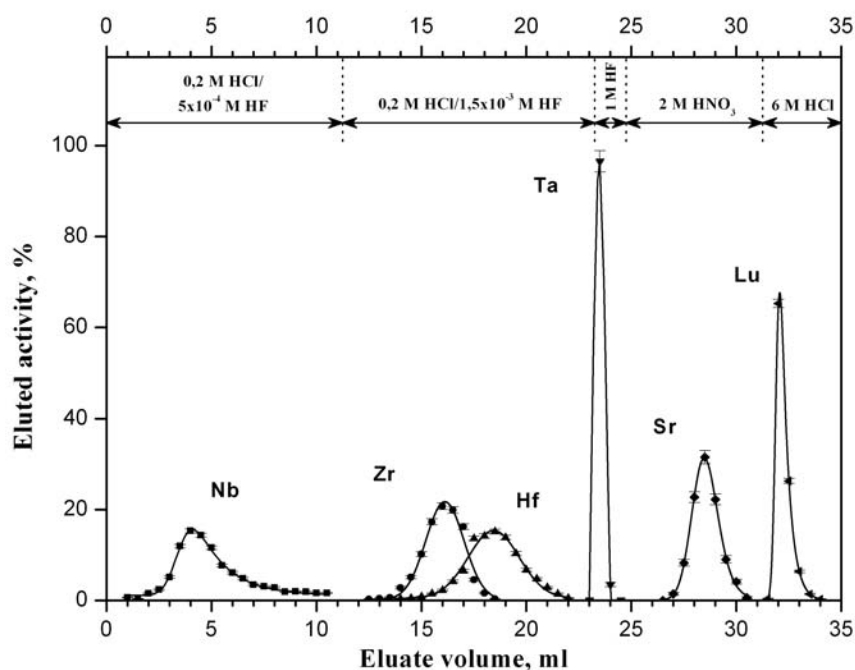


Fig. 1. Separation of Nb, Zr, Hf, Ta, Sr and Lu by cation exchange. (Dowex 50x8, 100-200 mesh, 6x30 mm)

The opportunity for ion exchange separation of Zr and Hf is shown. The developed scheme allows to exclude the presence of SF heavy actinides in fractions of separated elements.

On the basis of the data of the present work, it is possible to suggest the following order of the stability fluoride complexes of group IV and V elements: Nb (Pa) > Zr > Hf > Ta. The order of the complex formation is in agreement with theoretical predictions. Moreover, the

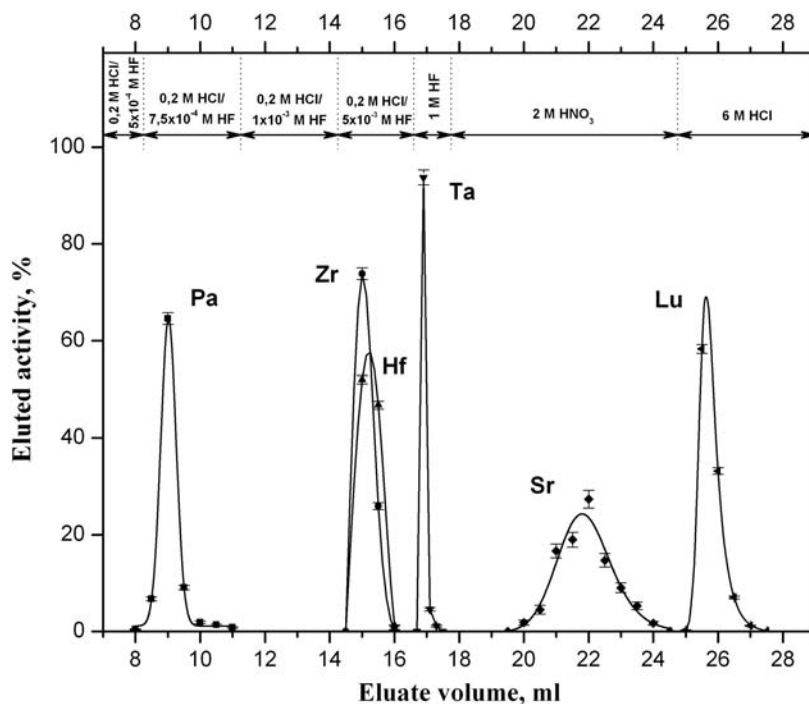


Fig. 2. Separation of Pa, Zr, Hf, Ta, Sr and Lu by cation exchange. (Dowex 50x8, 100-200 mesh, 6x30 mm)

radiochemical technique for the coprecipitation of group IV elements and Pa with LaF_3 followed by the anion exchange separation of Nb and Ta was developed.

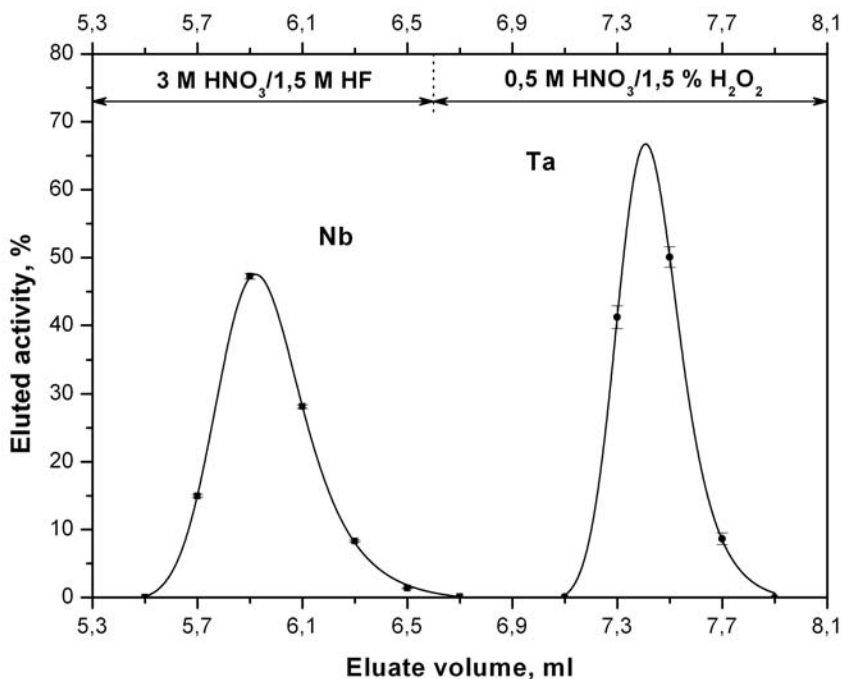


Fig. 3. Separation of Nb and Ta by anion exchange. (Dowex 1x8, 200-400 mesh, 6x10 mm)

This analytical procedure may be used in future heavy nuclei synthesis experiments for the separation of dubnium (Db) from other reactions products and for the study of its chemical properties.