

(Im-)possible ISOL beams

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In the frame of the EU-RTD project TARGISOL [1] we have collected diffusion and desorption data relevant for the release optimization from ISOL target and ion source units. Thus, existing ISOL beams could be improved in intensity and/or beam purity.

One of the new target prototypes tested on-line at ISOLDE provided pure beams of hafnium isotopes, covering the wide range from ^{158}Hf to ^{185}Hf and isomers with only 1 s half-life. The radioactive atoms of the refractory element hafnium (melting point 2233°C , boiling point 4603°C) were evaporated from the target and transported to a plasma ion source in form of volatile tetrafluoride molecules.

Similar chemical evaporation methods can open up the way to other “difficult” elements for which no ISOL beams exist at present. I will discuss the prospects for ISOL beams of the elements boron, technetium, ruthenium, tantalum, rhenium, osmium and iridium on the basis of the now available diffusion and desorption parameters.

[1] EU-RTD project TARGISOL (HPRI-CT-2001-50033), <http://www.targisol.csic.es/>