

## Highlights on the RE Atomic Vapor Laser Isotope Separation at IEAv

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The use of rare earths isotopes have increased significantly since the middle of last decade, their use is considered strategic in the international market and the isotopes have higher added values than the rare earth ores, as can be seen in the table below. These facts associated with the need to keep our expertise on the atomic process of laser isotope separation, obtained during the 1980 decade, induced the IEAv to start, in 2005, a program focused on rare earths isotope separation in our country, beginning with Nd, Dy and Er. The three were chosen due to their specific applications, mainly as: <sup>146</sup>Nd can be used to improve the auxiliary batteries for satellite devices; <sup>164</sup>Dy and <sup>167</sup>Er can be used as slow burning absorber for advanced heavy water reactors and used as burnable neutron poison, respectively; other applications for them are as laser active medium, optical amplifiers, optoelectronics components and other medical applications. This work will present some of our results and the infrastructure installed in the last ten years. Moreover, new challenges to be overcome will be discussed which will leverage technological innovation in this area in Brazil.

**Table:** Price List of some RE in the oxide form, metallic and isotopes of our interest. Quotation obtained in Nov 2015, from <http://www.buyisotope.com/> (accessed on 2016/07/07).

RE	Ore (99,5%) [US\$/kg]	Metal (99,5%) [US\$/kg]	Isotopes [US\$/g]
Nd	59,00	87,00	<sup>146</sup> Nd (99%): 15890,00
Dy	340,00	470,00	<sup>164</sup> Dy (97%): 13240,00
Er	77,00	165,00	<sup>167</sup> Er (95%): 13600,00
Yb	53,00	1575,00	<sup>168</sup> Yb (22%): 94700,00

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