

## Database of radioactive isotopes produced at the BigRIPS separator

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We have been developing a database of radioactive isotopes (RI) produced at the BigRIPS separator<sup>1)</sup>. The RI database entries include the following information:

- Production cross section
- Production yield
- Calculated value by LISE<sup>++</sup> code<sup>2)</sup>
- Experimental conditions
  - Primary beam
  - Target
  - Device settings
  - Magnetic rigidities
  - Measurement date
- Publication list
  - Title
  - Journal
  - First author
  - Journal digital object identifier (DOI)
  - Produced RI beam(s)
- Isomeric nucleus
  - Gamma ray energy
  - Half life

All entries are stored in a relational database that is based on Microsoft Access 2010.

The RI database is synchronized with a web site. The web site is coded using PHP. The top panel of Fig. 1 shows the web interface of the RI database. The RI database consists of nuclides, which includes RIs produced at the BigRIPS separator. RIs differentiated using red color text. The bottom panel of Fig. 1 shows an example, <sup>128</sup>Pd isotope. The production cross section and yield together with calculated value by LISE<sup>++</sup> code are listed. Two journals about <sup>128</sup>Pd are also shown there. The detailed BigRIPS setting for <sup>128</sup>Pd can be accessed through the hyperlinked ID value, 80.

This web site also has a retrieval interface. This search allows a Boolean AND search over several categories (mass number  $A$ , atomic number  $Z$ , neutron number  $N$ , and so on). The results of search are listed on the user's browser. Furthermore, the cross section file for LISE<sup>++</sup> and figures of production cross sections and production yields can be obtained from the search results.

The RI database and its web site assist on RIBF user to design RI beam experiments using the BigRIPS separator. Work on the system is currently ongoing and it is planned for practical implementation in the near future.

121Sb	122Sb	123Sb	124Sb	125Sb	126Sb	127Sb	128Sb	129Sb	130Sb	131Sb	132Sb	133Sb
120Sn	121Sn	122Sn	123Sn	124Sn	125Sn	126Sn	127Sn	128Sn	129Sn	130Sn	131Sn	132Sn
119In	120In	121In	122In	123In	124In	125In	126In	127In	128In	129In	130In	131In
118Cd	119Cd	120Cd	121Cd	122Cd	123Cd	124Cd	125Cd	126Cd	127Cd	128Cd	129Cd	130Cd
117Ag	118Ag	119Ag	120Ag	121Ag	122Ag	123Ag	124Ag	125Ag	126Ag	127Ag	128Ag	129Ag
116Pd	117Pd	118Pd	119Pd	120Pd	121Pd	122Pd	123Pd	124Pd	125Pd	126Pd	127Pd	128Pd
115Rh	116Rh	117Rh	118Rh	119Rh	120Rh	121Rh	122Rh	123Rh	124Rh	125Rh	126Rh	127Rh

<b>128Pd</b> Palladium Z = 46 N = 82						
ID <sup>1</sup>	Cross section (exp) [mb]	Error <sup>2</sup> [mb]	LISE <sup>++</sup> [mb]	Measurement date	Yield [pps/pnA]	Beam
80	1.17e-8	3.26e-9	1.43e-8	2008-11-21	5.49e-4	238U 345MeV
Publication						
Title			Journal		First Author	
Isomers in 128Pd and 126Pd: Evidence for a Robust Shell Closure at the Neutron Magic Number 82 in Exotic Palladium Isotopes			<a href="#">Phys. Rev. Lett. 111 (2013) 152501</a>		H. Watanabe	
Identification of 45 New Neutron-Rich Isotopes Produced by In-Flight Fission of a 238U Beam at 345 MeV/nucleon			<a href="#">J. Phys. Soc. Jpn. 79 (2010) 073201</a>		T. Ohnishi	

Fig.1. Web interface. The upper panel shows nuclides. Cyan, pale green, and yellow indicate nuclei, isomers, and new isotopes produced at the BigRIPS separator. The production cross section and production yield for the nucleus of interest can be accessed through the hyperlinked site. The lower panel shows an example of <sup>128</sup>Pd isotope. The production cross sections and production yields together with the BigRIPS setting are listed. Two journals about <sup>128</sup>Pd are also shown.

### References

- 1) T. Kubo et al.: Nucl. Instr. and Meth. **B 204**, 97 (2003).
- 2) O.B. Tarasov and D. Bazin: LISE<sup>++</sup> site, <http://lise.nscl.edu>, Michigan State University.

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