



ISOLDE Yield Database

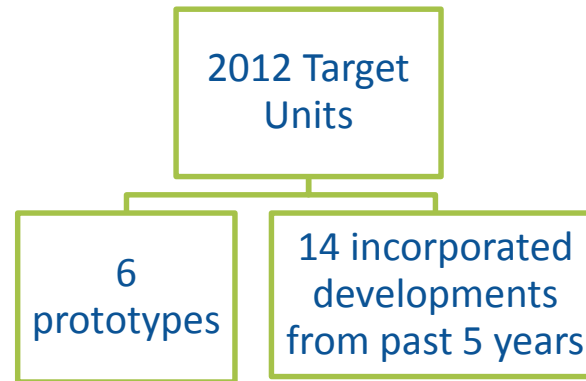
Tania Melo Mendonca

EN-STI-RBS



Motivation

- Update of the yield database with yield data following recent developments and publications
 - Summer student project 2014 of Hayley Osman (Missouri State University)
 - Complemented with update of ionization parameters by Janka Stritsovská (Comenius University, Slovakia)



- Graphical layout lost with change of the ISOLDE website
- Update of database code needed to restore graphics
- Proposal of creating website hosting target information and link to database
Transparency to future Isolde website changes
- Diffusion and effusion information to be included

Update of the database

Graphical restoration (lost with new ISOLDE website)

Cloned database for data update and analysis of the problems

```

1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN" "http://www.w3.org/TR/html4/loose.dtd"><HTML>
2 <HEAD>
3 <meta http-equiv="Content-Type" content="text/html; charset=utf-8" /><meta http-equiv="Cache-Control" content="no-cache"><META
4 <LINK REL="stylesheet" HREF="http://isolde.web.cern.ch/isoled/yields/css/isoled_yield_db.css" TITLE="text/css">
5 <script src="http://isolde.web.cern.ch/isoled/yields/js/isoled_yield_db.js" type="text/javascript"></script>
6
7 <BODY onload="">
8 <H1 ALIGN="CENTER">Access to the Yield information</H1>
9 <HR>
10 <div id="nt_link"><div id="target_link"><FORM ACTION="q_tgt_isotope" METHOD="POST">
11 <B>Find the produced isotopes from a given target </B>
12 <SELECT NAME="v_symbol" SIZE="1" id="id_st" onchange="SelectTarget('id_st', 'q_tgt_isotope?v_symbol=")";
13 <OPTION>...
14 <OPTION value="Ba">Ba
15 <OPTION value="C">C
16 <OPTION value="Ca">Ca
17 <OPTION value="Ce">Ce
18 <OPTION value="Gd">Gd
19 <OPTION value="Ge">Ge
20 <OPTION value="Ir">Ir
21 <OPTION value="La">La
22 <OPTION value="Mg">Mg
23 <OPTION value="Nb">Nb
24 <OPTION value="Pb">Pb
25 <OPTION value="Pt">Pt
26 <OPTION value="Sc">Sc
27 <OPTION value="Si">Si
28 <OPTION value="Sn">Sn
29 <OPTION value="Sr">Sr
30 <OPTION value="Ta">Ta
31 <OPTION value="Te">Te
32 <OPTION value="Th">Th
33 <OPTION value="Ti">Ti
34 <OPTION value="U">U
35 <OPTION value="V">V
36 <OPTION value="Zr">Zr
37 </SELECT>
38 <noscript><INPUT TYPE="submit" VALUE="Submit">
39 </noscript></FORM>
40 </div><div id="nucl_link"><A HREF="nucl_chart.nuclear_chart?scale=1">Nuclear Chart for ISOLDE</A>
41 </div></div><HR>
42 <B>Find the produced isotope from an element independent on target</B>
43 <P>
44 <TABLE class="i_periodicTable">
45
46 <tr align="center">
47 <th class="i_bigSize">Group</th>
48 <th class="i_normalSize">1</th>
49 <th class="i_normalSize">2</th>
50 <th class="i_smallSize"></th><th class="i_normalSize"></th>
51 <th class="i_normalSize">4</th>
52 <th class="i_normalSize">5</th>
53 <th class="i_normalSize">6</th>
54 <th class="i_normalSize">7</th>
55 <th class="i_normalSize">8</th>
56 <th class="i_normalSize">9</th>
57 <th class="i_normalSize">10</th>
58 <th class="i_normalSize">11</th>
59 <th class="i_normalSize">12</th>
60 <th class="i_normalSize">13</th>
61 <th class="i_normalSize">14</th>

```

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18				
	1A	2A	3B	4B	5B	6B	7B		8B		1B	2B	3A	4A	5A	6A	7A	8A				
Period																						
	Ion source:																					
	+ Surface -																					
1	1																	2				
	H																	He				
	hot Plasma cool																					
2	3	4															5	6	7	8	9	10
	Li	Be															B	C	N	O	F	Ne
	Laser																					
3	11	12															13	14	15	16	17	18
	Na	Mg															Al	Si	P	S	Cl	Ar
4	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36				
	K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr				
5	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54				
	Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe				
6	55	56	* 71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86				
	Cs	Ba	Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn				
7	87	88	** 103	104	105	106	107	108	109	110	111											
	Fr	Ra	Lr	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg											
* Lanthanides *	57	58	59	60	61	62	63	64	65	66	67	68	69	70								
	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb								
** Actinides **	89	90	91	92	93	94	95	96	97	98	99	100	101	102								
	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No								



Graphical restoration - proposal

Creation of website with target information (<https://cern.ch/test-isolde-yields>)

Link to database

Graphical restoration process ongoing



The Radioactive Ion Beam facility

Facility Experiments User info Local group Contacts

Facility History Targets & Separators Projects REX-ISOLDE RILIS Experimental set-ups

The ISOLDE Radioactive Ion Beam facility



- USEFUL LINKS
- Weekly schedules
- ISOLDE and nTOP Experiments Committee (INTC)
- HIE-ISOLDE
- TSR@ISOLDE
- ISOLDE Logos, Layouts and Templates
- Machine FAQs
- On-Line Info (VISTAR, e-logs, ...)
- Seminars
- Yield Database
- Access to ISOLDE Facility
- PH Newsletter



Access to the Yield Information

[ISOLDE nuclide chart](#)

[Find the produced isotopes from a given target](#) -- v

[Find the produced isotopes from an element independent on the target](#)

[Diffusion and effusion](#)

[In target production rates from a given target](#) -- v

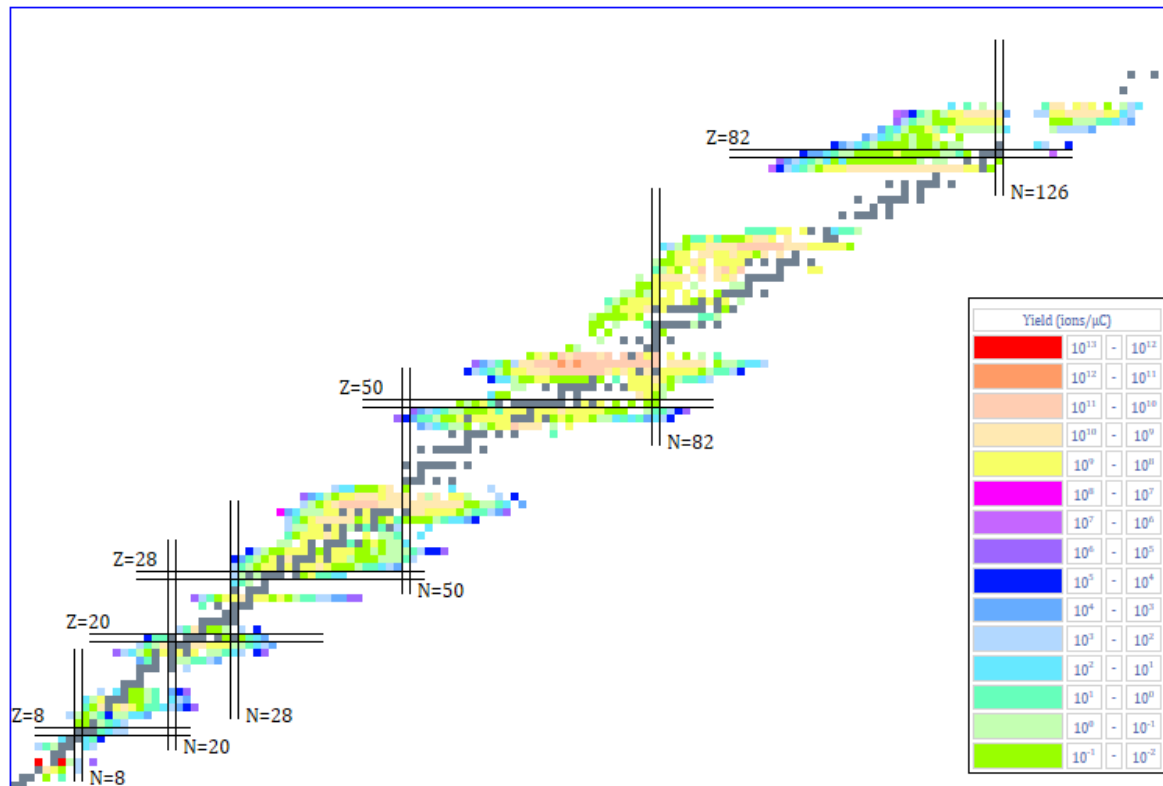
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To do so, you should edit the file <http://test-isolde-yields.web.cern.ch/test-isolde-yields/default.htm>



ISOLDE nuclide chart

Nuclear Chart for ISOLDE



Access to yield values

Find the produced isotopes from an element independent on the target

Find the produced isotopes independent on the target

Group	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	1A	2A	3B	4B	5B	6B	7B	8B			1B	2B	3A	4A	5A	6A	7A	8A	
Period																			
1	1 H																		2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr	
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe	
6	55 Cs	56 Ba	* 71 Lu	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn	
7	87 Fr	88 Ra	** 103 Lr	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg								
* Lanthanides			* 57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb			
** Actinides			** 89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No			

Ion source:

+	Surface	-
hot	Plasma	cool
	Laser	

[Main page](#)

Yields of the isotopes of the element: Oxygen

19, 20, 22, 21 O

Production details: Target density, Ion Source, Reference, ...

Element	A number	Half life	SC or PSB*	Yield at ISOLDE (ions/ μC)	Target material
O	19	26.91 s 8	PSB	1.3E+05	UC _x
O	20	13.51 s 5	PSB	3.4E+04	UC _x
O	21	3.42 s 10	PSB	7.0E+03	UC _x
O	22	2.25 s 15	PSB	1.3E+03	UC _x
O	19 - g	26.91 s 8	SC	1.5E+04	PtC
O	19 - g	26.91 s 8	SC	1.0E+03	PtC
O	20 - g	13.51 s 5	SC	1.2E+04	PtC
O	20 - g	13.51 s 5	SC	7.5E+02	PtC
O	21 - g	3.42 s 10	SC	1.5E+03	PtC
O	22 - g	2.25 s 15	SC	2.0E+01	PtC
O	22 - g	2.25 s 15	SC	4.5E+02	PtC

**In the ISOLDE Yield Database the beam intensities for isotopes of the elements measured at ISOLDE PSB (PS Booster with 1.0 or 1.4 GeV protons) are presented. For isotopes where no new yields are listed yet from the PSB, one can get an idea from looking at the available SC yields (0.6 GeV protons).*

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For more information please contact the ISOLDE Physics Coordinator, [Magdalena Kowalska](#)
For more details please contact the ISOLDE RIB development Group, [Thierry Stora](#)

Database and web application created by: [Manuela Turrion](#) & [Urszula Herman-Izycka](#)

O -Oxygen

More information available after [login](#).

Element	Yield (ions/ μ C)	PSB/SC	Energy (GeV)	Target	Target thickness (g/cm ²)	Ion Source	Reference
¹⁹ O	1.3E+05	PSB	1.4	UC _x (UCx/graphite)	44	MK7	[Koe05]
²⁰ O	3.4E+04	PSB	1.4	UC _x (UCx/graphite)	44	MK7	[Koe05]
²¹ O	7.0E+03	PSB	1.4	UC _x (UCx/graphite)	44	MK7	[Koe05]
²² O	1.3E+03	PSB	1.4	UC _x (UCx/graphite)	44	MK7	[Koe05]
¹⁹ O	1.5E+04	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]
¹⁹ O	1.0E+03	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]
²⁰ O	1.2E+04	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]
²⁰ O	7.5E+02	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]
²¹ O	1.5E+03	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]
²² O	2.0E+01	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]
²² O	4.5E+02	SC	0.6	PtC (Pt Metal/graphite mix)	26.8	MK7 (Plasma)	[Klu86]

[Koe05] U. Koester, et al.; Eur. Phys. J. A 25 (2005) 729.

[Klu86] H.-J. Kluge (editor) ISOLDE Guide for Users; CERN 86-05 (1986)

[Information about ISOLDE Targets and Ion sources \(ISOLDE Web page\)](#)

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ISOLDE Admin Page

Please enable cookies and Javascript.

Login:	<input type="text"/>
Password:	<input type="password"/>
	<input type="submit" value="Submit"/>

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Ongoing tasks



Access to the Yield Information

ISOLDE nuclide chart

Find the produced isotopes from a given target

Graphical restoration ongoing

Find the produced isotopes from an element independent on the target

Diffusion and effusion

In target production rates from a given target

Calculations ongoing in collaboration with Univ. Bratislava

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Yield data update

- ✓ 200+ Publications reviewed
- ✓ 205 Yield entries for Open Access

Nitrogen										
N										
A Number	Half life	Energy (GeV)	Yield at ISOLDE (Ions/ μ C)	Database Yield (Old)	Target Material	Target Details	Target thickness (g/cm ²)	Target temperature	Ion source	Publication Source
16N+14N		1.4	6.00E+03		NaF-LiF	478	24.51	725 C	VD7	GPS E log 12/6/12
17N+14N		1.4	5.00E+03		NaF-LiF	478	24.51	725 C	VD7	GPS E log 12/6/12
17N+14N		1.4	1.40E+04		NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
Oxygen										
O										
Fluorine										
F										
A Number	Half life	Energy (GeV)	Yield at ISOLDE (Ions/ μ C)	Database Yield (Old)	Target Material	Target Details	Target thickness (g/cm ²)	Target temperature	Ion source	Source
17	64.49 s	1.4	1.27E+03	None	NaF-LiF	478	24.51	725 C	VD7	GPS E log 12/6/12
Neon										
Ne										
A Number	Half life	Energy (GeV)	Yield at ISOLDE (Ions/ μ C)	Database Yield (Old)	Target Material	Target Details	Target thickness (g/cm ²)	Target temperature	Ion source	Source
18	1672 ms	1.4	2.00E+04	None for target	NaF-LiF	478	24.51	725 C	VD7	GPS E log 12/6/12
18	1672 ms	1.4	9.10E+03	None for target	NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
18	1672 ms	1.4	2.50E+04	None for target	NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
18	1672 ms	1.4	3.00E+04	None for target	NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
19	17.22 s	1.4	7.00E+06	None for target	NaF-LiF	478	24.51	725 C	VD7	GPS E log 12/6/12
19	17.22 s	1.4	7.00E+06	None for target	NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
19	17.22 s	1.4	6.00E+06	None for target	NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
19	17.22 s	1.4	9.00E+05	None for target	NaF-LiF	478	24.51	at 283 A	VD7	GPS E log 13/6/12
Sodium										
Na										
A Number	Half life	Energy (GeV)	Yield at ISOLDE (Ions/ μ C)	Database Yield (Old)	Target Material	Target Details	Target thickness (g/cm ²)	Target temperature	Ion source	Source
20	447.9 ms	1.4	1.20E+05	SC ONLY	SiC	483	14.13	1640 C (at 490 A)		HRS E log 1/8/12
20	447.9 ms	1.4	3.00E+06	SC ONLY	SiC	483	14.13			HRS E log 8/8/12
21	22.49 s	1.4	1.30E+07	SC ONLY	SiC	483	14.13	1640 C (at 490 A)		HRS E log 1/8/12
21	22.49 s	1.4	3.35E+02	SC ONLY	NaF-LiF	478	24.51	725 C	VD7	GPS E log 12/6/12
21	22.49 s	1.4	9.00E+07	SC ONLY	SiC	483	14.13			HRS E log 8/8/12
27	301 ms	1.4	2.20E+03	None for target	SiC	483	14.13	1640 C (at 490 A)		HRS E log 1/8/12
27	301 ms	1.4	4.00E+06	8.50E+06	Ucx	484	33.65	2050 C (at 690 A)	W	GPS E log 10/8/12
27	301 ms	1.4	5.50E+04	None for target	SiC	483	14.13			HRS E log 8/8/12
27	301 ms	1.4	3.30E+06	8.50E+06	Ucx	487	33.65	at 600 A		HRS E log 4/9/12
30	48 ms	1.4	2.17E+03	5.10E+04	Ucx	487	33.65	at 600 A		HRS E log 4/9/12
Magnesium										
Mg										
A Number	Half life	Energy (GeV)	Yield at ISOLDE (Ions/ μ C)	Database Yield (Old)	Target Material	Target Details	Target thickness (g/cm ²)	Target temperature	Ion source	Source
27	9.46 m	1.4	4.20E+08	1.50E+07	Ucx	487	33.65	at 600 A		HRS E log 4/9/12
30	335 ms	1.4	7.50E+05	6.00E+05	Ucx	477	30.84	2000 C	W	HRS E log 14/8/12
30	335 ms	1.4	1.20E+06	6.00E+05	Ucx	487	33.65	at 600 A		HRS E log 4/9/12

Thank you
for your attention!

- ✓ 2 Years of E-logs (~1,500 entries) – Being completed with 2014/2015 data
- ✓ 184 Unpublished yield entries
- ✓ Unpublished data to be included in CERN yellow paper by TISD team