

Super-Heavy Element Production Cross Section in EXFOR ($A \geq 260$)

(N. Otsuka, 2011-05-17)

There are some EXFOR entries providing production cross sections for super-heavy elements. EXFOR is not comprehensive for such data and compiled datasets may not be representative of the best available experimental work.

Due to insufficient manpower, NRDC cannot maintain the EXFOR library as complete for heavy-ion induced reaction data in general. Since the ENSDF database for $A \geq 260$ being currently kept updated by Dr Mohini Gupta (Manipal University, India) strives to contain comprehensive reaction data and other experimental details, a preliminary joint working plan for EXFOR is hereby proposed. It is agreed that any entries appearing in EXFOR should at a minimum:

- 1) include representative data for elements which have a name and an associated chemical symbol;
- 2) be updated if mass assignments are revised following their inclusion into EXFOR and
- 3) include the most recent data in existing cases where older publications are reflected.

As a first step, she agrees to jointly review with us the existing EXFOR entries for $A \geq 260$ (See Table of this note), propose a revision of existing entries (if necessary) and the selective addition of a sub-set of experimental work(s) based on which the priority of discovery for a particular element has been awarded by IUPAC-TWG-JPC. NDS will consider these recommendations and request the NRDC to improve the EXFOR Library based on her suggestions, manpower permitting.

NDS will label relevant new experimental publications in the EXFOR Compilation Control Database with “hi” (heavy-ion) on a trial basis. NDS will also propose that NRDC encourage the compilation of these data, though they will be kept in the category of “Voluntary Compilation” (i.e., priority lower than n, p, light-ion ($A \leq 12$) induced reaction data).

Revisions to this preliminary working plan will be made according to practicality and requirement following joint consultations.

In the table in the next page, underlined element symbols are coded with * under REACTION code, and must be corrected. They are registered into http://www-nds.iaea.org/nrdc/error/exfor_err1.html as a reminder to data centres.

List of super-heavy element ($A > 260$) production cross sections in EXFOR

Entry	Nuclide	Institute	1 st author	Reference*
A0005	RF-260	4ZZZDUB	V.A.Druin	J,SNP,24,131,1976
A0010	RF-260	4ZZZDUB	V.A.Druin	J,SJA,43,785,1977
A0051	DB-262 SG-263	4ZZZDUB	V.A.Druin	J,SNP,29,591,1979
A0052	HS-270 HS-271 HS-272	4ZZZDUB	Ju.C.Oganesjan	R,JINR-P7-12054,1978
A0054	<u>Cn-279</u> <u>Rg-276</u> <u>Ds-278</u> <u>Rg-277</u> <u>Ds-277</u>	4ZZZDUB	G.M.Ter-Akop'jan	J,SNP,29,312,1979
A0055	Hs-262 Hs-263 Hs-264	4ZZZDUB	O.A.Orlova	R,JINR-P7-12042,1979
A0856	118-294 116-291 116-290 116-289	4ZZZDUB	Yu.Ts.Oganesian	J,PR/C,74,044602,2006
C1512	Sg-262 Sg-263 Sg-264	1USABRK	K.E.Gregorich	J,PR/C,74,044611,2006
C1607	Rf-260 Rf-261	1USABRK	J.M.Gates	J,PR/C,77,034603,2008
C1682	Hs-268 Hs-269	2GERGSI	J.Dvorak	J,PR/C,79,037602,2009
C1684	Hs-263	1USABRK	I.Dragojevic	J,PR/C,79,011602,2009
E1918	Ds-271	2JPNIPC	K.Morita	J,EPJ/A,21,257,2004
E1919	Rg-272	2JPNIPC	K.Morita	J,JPJ,73,1738,2004
E1920	113-278	2JPNIPC	K.Morita	J,JPJ,73,2593,2004
E1994	Rf-261 Db-262	2JPNJAE	Y.Nagame	J,JNRS,3,85,2002
E2054	<u>Cn-277</u>	2JPNIPC	K.Morita	J,JPJ,76,043201,2007
E2055	113-278	2JPNIPC	K.Morita	J,JPJ,76,045001,2007
E2091	Sg-262 Sg-263 Sg-264 Sg-265	2JPNJAE 2GERGSI	K.Nishio	J,JNRS,8,73,2007
E2137	Hs-263	2JPNIPC	D.Kaji	J,JPJ,78,035003,2009
E2176	Bh-266 Bh-267	2JPNIPC	K.Morita	J,JPJ,78,064201,2009
O1650	Hs-269 Hs-270 Hs-271	2GERGSI	J.Dvorak	J,PRL,100,132503,2008
T0137	Rf-261	1USAORL 1USABRK	R.J.Silva	J,NP/A,216,97,1973