

Subject:

Recommendation to improve the quality of EXFOR

From:

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Date:

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Dear colleagues,

Please find attached a short write-up on the EXFOR database that I put together during the past weeks. It contains recommendations to improve the quality of EXFOR

and a plea for more interaction between the data centers and EXFOR users. I am interested to hear your views on this.

Suggestions for improvement and a list of errors are given.

Also, I hope this paper can be covered during the NRDC meeting at the end of this month,

that some of you will attend.

If you feel someone has been left out of this mailing list please forward it to him/her.

Looking forward to any comments on this.

Best regards,

Arjan

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Recommendation to improve the quality of EXFOR (CSISRS)

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Room document for NRDC meeting, September 25-28, 2006 at the IAEA

Among the existing databases with nuclear reaction data, EXFOR is the most important and most complete. The document 'CSISRS History' on <http://www.nndc.bnl.gov/exfor3/exfor00.htm> reveals the effort that has gone into the database over the past half century. As advertised by the various nuclear data centers, the library contains data from more than 15,500 experiments. Assuming a very rough estimation of the investment value (salaries, equipment, etc.) of one experiment to be 1 million Euros, it is not too difficult to get an idea of the value that the EXFOR database represents. (Don't take this statement too literally: the value of all historical experimental work represents more than just the final tabulated numbers, but still.....).

In this short write-up, I wish to address the completeness, the quality assessment, and formatting issues of the EXFOR database, from the point of view of a user. To summarize, there will be two recommendations:

- Correction of the most obvious errors in the EXFOR database. A preliminary list of errors is provided in this document.
- Availability of all experimental data (or at least a larger amount than is available now) present in EXFOR in tabular format. This requires either (a) correction or unification of EXFOR reaction identifiers or (b) correction and completion of translation software (such as the X4toC4 code).

Hence, although important for the long-term, the emphasis here is NOT (yet) on the completeness of EXFOR or modernization of the format.

There are various reasons why the quality of EXFOR is so important, but I will restrict myself to only two here:

1. Nuclear model codes. Evaluated data libraries are relying more and more on nuclear model calculations which, thanks to fast computers, can provide data in regions where no measurements exist. The nuclear model codes would however be nowhere without EXFOR, as their parameterisations are based on the available experimental data. Massive nuclear model calculations across the periodic table of elements can now be performed automatically and an easy comparison with the existing experimental data would be extremely helpful for validating these model codes. The same holds for evaluation of individual isotopes. It is important that an evaluator has easy access to all available data, and that these data are correctly represented in the database.

2. The recent revival of covariance data as a very important ingredient for reactor physics analyses of advanced reactors. It is not only required *that* the data are good, but also to know *how* good they are. Once this is properly assessed for key nuclear reactions, on the basis of *all existing* experimental and theoretical information, proposals for new measurements can much better be justified, as they will have much more impact for technological applications. An important condition is that the data in EXFOR are retrievable and reliable.

These two issues alone require that EXFOR is not only a large and complete database, but also a properly validated database (similar to the Evaluated Nuclear Data Files). The quality assessment, validation, and ultimately correction of the EXFOR database can be done on 4 levels, I think. In increasing order of effort these are:

1. Correction of the most obvious errors:
 - A. Physical errors, e.g. if barns are given where millibarns should be given. (or MeV instead of eV, etc.). These errors are often directly visible and readily emerge upon trying to process the entire EXFOR library (as I recently did, see the last Section).
 - B. Format errors, for either the X4 or tabular format. There are errors in the reaction identification in the "mother database", and in the codes used at the Data Centers to handle the numerical data, e.g. X4toC4. This prevents proper use of the reaction data, and worse, reaction data may appear not to exist.
2. Correction of more difficult to find, but still obvious dimensional errors, e.g. millibarns instead of barns, through comparison with nuclear model codes or other measurements of the same reaction.
3. Quality flagging of the data through comparison with other measurements of the same reaction and nuclear model codes.
4. A review team consisting of high-quality experimentalists, who judge each experiment (or at least an important subset of the database) in detail, regarding measurement method used, quality of data analysis, reputation on the authors and lab, etc.. and then assign a quality flag.

Although 4 may not yet be reached (for various reasons, among which money and available expertise), certainly 1 and 2, and preferentially 3 should be carried out in my opinion. Probably only 1 and 2 are truly tasks of the Nuclear Data Centers, at least to the extent that the databases should be corrected and updated, and I hope that this can be realized through collaboration with EXFOR users. Since EXFOR represents strictly a compilation of nuclear data, quality flagging (3 and 4) may not fall within the mission of the data centers, and should, in that case, be restricted to derived libraries. Whether this is true, can be discussed however.

Regarding 1B, one might consider a possible reformatting of some data in a unique, consistent way. Sometimes, the freedom that has been given to the compiler leads to non-systematic storage of the data. Residual production cross sections and inelastic cross sections to specific discrete levels are notable examples of reactions which are inconsistently stored.

Also regarding 1B, it is important to complete EXFOR translation codes, such as X4toC4 or the code used at NEA, so that all nuclear reaction data is available in tabular format, with full flexibility. Not only would that make the entire database available in easy numerical format, but this will also help to validate the data itself, since it can easily be plotted against other data for the same reaction or model codes. I have noted that there are different EXFOR translation programs, since the NEA database has a different tabular format than the one at IAEA and BNL/IAEA (at the moment, I prefer the latter, but may not know about all possibilities of the two methods). Are there any plans to unify this among the data centers? With the aid of BNL (Dimitri Rochman) I have attempted to process the entire EXFOR database, in C4 format, into a directory-structured reaction database that I found easier, and more intuitive, to use for our purposes. The choice for such a database structure is of course very personal, and I expect nobody to adopt our system. However, just like CHECKR, FIZCON, and NJOY find ENDF-6 formatting errors, my translation code finds errors in EXFOR, both regarding unphysical numbers and format problems, that might otherwise not have come to the surface. If the software such as X4toC4 is extended, more errors will be revealed and can be corrected.

Regarding 3, there are various listed cross sections in EXFOR which are, to put it mildly, rather dubious. This can be the result of an error by the compiler, or simply a wrongly measured value. The question is to what extent the original authors should be protected against that. The last part of this document contains all wrong and suspicious cases that I found so far (using the current ability of X4toC4). Various of these reported values fall under class 1. above, and these should be repaired, since I don't think we do e.g. Alan Smith justice if EXFOR reports that his inelastic cross sections on Ag-107 range from 100-400 barns, see Figure 1. (Actually, a third reason for upgrading the quality of EXFOR: hard experimental work deserves to be correctly represented). Here, the misprint of barns instead of millibarns is so obvious that a person who a/ works at a Data Center and b/ is a bit knowledgeable on the magnitude of cross sections can change this. The alternative is to wait for more errors like this and then send the job out to a contractor who corrects everything at the same time. The list contains also cases where e.g. the (n,2n) cross section exceeds 4 barns. This is not a millibarn-barn dimensional error but a problem with the measurement, in my view. This falls in class 3, and maybe should be left untouched in first instance. I will however report such cases for completeness. Here I also wish to mention that Robin Forrest and Jura Kopecky have their own database of activation cross sections, which of course takes EXFOR as the starting point, in which they use normalization factors to correct for these obvious b/mb and MeV/eV errors and also apply binary quality flags (include yes or no) of all the available experimental data. I believe that they have already reported various errors to the data bank.

There are other issues, such as the decision on whether the historical EXFOR format (1969?) should be retained for the coming decades or not. Anyway, if it is decided to change, it will not hurt if (almost) all errors have been corrected through the procedures mentioned above. I don't recommend a change of the EXFOR format now, but just that the entire current database can be converted into numerical tables. Obviously, the usual yearly updating of neutron reaction data and further completion of photonuclear and charged-particle induced data has my strong support. A possible extra activity to fulfill this is to compare EXFOR with CINDA and NSR and see whether there is missing data that should be included.

Finally, in my opinion the completeness, quality assessment, and the formatting issues of EXFOR are so important that I could foresee a CRP or a WPEC subgroup on the subject. If it turns out that this is formally difficult, some type of task force or working group that deals with this matter could be invoked. The essence is that there are *both* users and EXFOR administrators present in such an activity, and this

EXFOR database: MT51

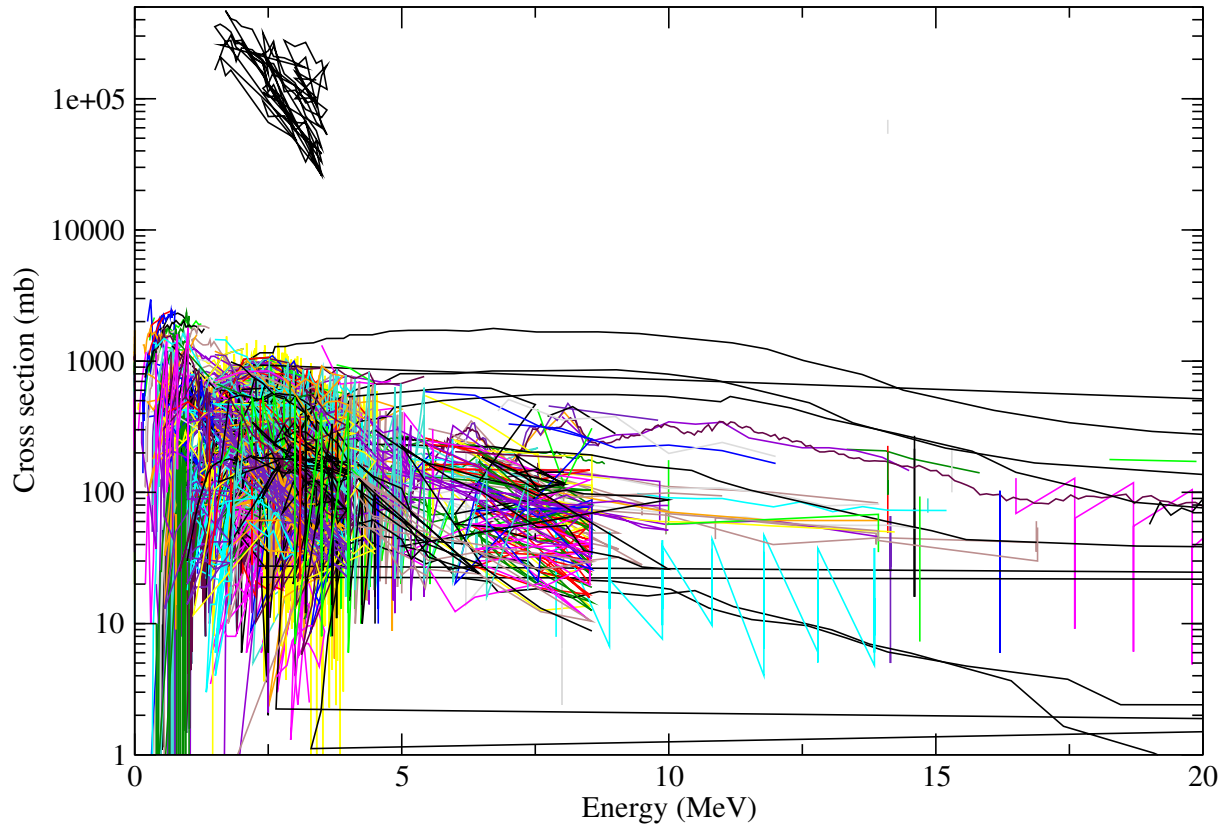


Figure 1: EXFOR data for MT51: the outliers are (n,n') data from A.B. Smith on Ag-107.

has so far been lacking.

The rest of this document contains a write-up of found problems. I believe that Dimitri Rochman will present this, as memo CP-C378, at the NRDC meeting, September 25-28, 2006 at the IAEA.

Errors and restrictions in the X4toC4 translation

In the process of translating EXFOR into a directory-structured database, the following problems have been found:

If a publication is after 2000, the year attached to the author in the C4 format is wrong, e.g.

A.B.Smith (20) 13965 2

Instead of chopping the last 2 digits of the year, the century, 20, should be left out. Finally a true

millennium bug! There are no problems for publications before 2000. Years after 2000 should be given as (00) (01) (02) etc. In this way, the C4 format will remain valid until 2035! This should be an easy fix in the X4toC4 code.

Concerning retrieval through the Web, there seem to be (only!) 2 problems related to data in C4 format.

1. Year 1951: EXFOR ID 11045, Brolley
2. Year 1978: EXFOR ID 10988, Hsue + (angular distributions of fission fragments) I didn't check which of the 2 sub ID's caused the problem.

My browser gets stuck on these data sets. If these two errors are repaired, I think the entire current C4 database can be downloaded by the user. (The problem is of course that not all of EXFOR can currently be represented in C4 format).

There may be some trouble with sub-ID numbers for particle spectra. Below I attach a block of 6 C4-lines from an experiment from 1971. Bertrand et al measured energy spectra of protons on Bi209 for two incident energies, 38.7 and 61.7 MeV. These 2 incident energies represent clearly two different reactions. However, the EXFOR sub ID number in the very last column remains the same (6). This means that to isolate each spectra individually one has to carry out difficult checks to check whether a new incident energy has started etc.. For other reactions of the same type the EXFOR sub ID sometimes does change, as it should. This should be consistently treated throughout the database.

```

1001 83209 59000 3.8700+7 100000.0 2.6300-9 8.000-11
1002.9 2.9000+7 1000000. E2F.E.BERTRAND,ET.AL. (71) 00290 6
1001 83209 59000 3.8700+7 100000.0 8.3500-9 2.800-10
1002.9 3.1000+7 1000000. E2F.E.BERTRAND,ET.AL. (71) 00290 6
1001 83209 59000 3.8700+7 100000.0 1.0030-8 1.400-10
1002.9 3.2910+7 910000.0 E2F.E.BERTRAND,ET.AL. (71) 00290 6
1001 83209 59000 6.1700+7 100000.0 2.500-10 4.000-11
1002.9 4930000. 200000.0 E2F.E.BERTRAND,ET.AL. (71) 00290 6
1001 83209 59000 6.1700+7 100000.0 2.300-10 2.000-11
1002.9 5330000. 200000.0 E2F.E.BERTRAND,ET.AL. (71) 00290 6
1001 83209 59000 6.1700+7 100000.0 2.200-10 2.000-11
1002.9 5730000. 200000.0 E2F.E.BERTRAND,ET.AL. (71) 00290 6

```

Another type of problem concerns collecting the data in appropriate groups. There are many examples like the one given below. EXFOR has an accession number, a sub-accession number and a multi-dimension table flag. All data belonging to one class should preferentially appear sequentially in the output, so that there is a clear block of data. Below you see how the numbers 451 and 452 alternate, making it difficult to easily extract a data block for the same reaction.

```

1 30064 3 103 A 5725000. 328000.0 0.161600 8.2410-3
1 30064 203 103 A 5725000. 328000.0 0.272100 0.013880 18.9 92238.9

```

```

1 30064    3 103 A  6277000. 326000.0 0.177600 9.0570-3
1 30064 203 103 A  6277000. 326000.0 0.236200 0.012050      18.9  92238.9
1 30064    3 103 A  6978000. 334000.0 0.162600 8.1320-3
1 30064 203 103 A  6978000. 334000.0 0.175600 8.7780-3      18.9  92238.9

```

Finally, several data sets apparently can not be translated into C4. If you e.g. retrieve all the data with target Zr-90 and author Richter you get various sets of (p,xp) double-differential spectra. In EXFOR format the data are there, in C4 format there is not a single data point, but however a message that the data could not be translated. Apparently, the X4toC4 code needs to be extended to cover this. Similar messages are given by the NEA translation program.

Errors in the EXFOR data.

While processing the data into a directory-structured database, a check was built it to report partial cross sections for energies above 1 MeV with a value that exceeds 4 barns. To my knowledge, such values are physically not possible. In many cases, it concerns dimensional errors (barns instead of millibarns). The list is given below. I think that the cases for incident neutrons should have the highest priority, but eventually, all problems should be solved. At the moment the list gives magnitudes of cross sections only, but my system could be extended to check values for other quantities and other possible errors as well.

```

ZAP= 1   Z= 47  A= 0  MT= 102  Author E.T.BOOTH,ET.AL. (37)      1937
  E=  2.50000000 MeV xs=  7400.00000 mb +- 518.000000 EXFOR ID:21786 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E=  7.09999990 MeV xs=  68400.00000 mb +- 800.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E=  9.60000038 MeV xs=  330000.000 mb +- 5000.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E= 11.69999998 MeV xs=  491000.000 mb +- 6000.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E= 13.50000000 MeV xs=  683000.000 mb +- 8000.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E= 15.10000004 MeV xs=  681000.000 mb +- 8000.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E= 16.60000004 MeV xs=  653000.000 mb +- 8000.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E= 17.89999996 MeV xs=  461000.000 mb +- 6000.000000 EXFOR ID:C1047 3
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E=  3.40000010 MeV xs=  4400.00000 mb +- 400.000000 EXFOR ID:C1047 4
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E=  7.09999990 MeV xs=  85000.00000 mb +- 1000.000000 EXFOR ID:C1047 4
ZAP= 1002  Z= 73  A= 181 MT= 9000  Author S.J.Balestrini (54)      1954
  E=  9.60000038 MeV xs= 183000.000 mb +- 2000.000000 EXFOR ID:C1047 4

```

ZAP= 1002 Z= 73 A= 181 MT= 9000 Author S.J.Balestrini (54) 1954
E= 11.6999998 MeV xs= 172000.000 mb +- 2000.00000 EXFOR ID:C1047 4
ZAP= 1002 Z= 73 A= 181 MT= 9000 Author S.J.Balestrini (54) 1954
E= 13.5000000 MeV xs= 181000.000 mb +- 2000.00000 EXFOR ID:C1047 4
ZAP= 1002 Z= 73 A= 181 MT= 9000 Author S.J.Balestrini (54) 1954
E= 15.1000004 MeV xs= 171000.000 mb +- 2000.00000 EXFOR ID:C1047 4
ZAP= 1002 Z= 73 A= 181 MT= 9000 Author S.J.Balestrini (54) 1954
E= 16.6000004 MeV xs= 175000.000 mb +- 2000.00000 EXFOR ID:C1047 4
ZAP= 1002 Z= 73 A= 181 MT= 9000 Author S.J.Balestrini (54) 1954
E= 17.8999996 MeV xs= 140000.000 mb +- 2000.00000 EXFOR ID:C1047 4
ZAP= 1 Z= 80 A= 204 MT= 102 Author A.I.LEIPUNSKIJ, (58) 1958
E= 2.69989991 MeV xs= 50000.0000 mb +- 0.00000000E+00 EXFOR ID:40244
ZAP= 1 Z= 80 A= 204 MT= 102 Author A.I.LEIPUNSKIJ, (58) 1958
E= 4.00000000 MeV xs= 25000.0000 mb +- 0.00000000E+00 EXFOR ID:40244
ZAP= 1 Z= 16 A= 32 MT= 51 Author R.L.CLARKE,ET.AL. (64) 1964
E= 14.1000004 MeV xs= 69000.0000 mb +- 11000.0000 EXFOR ID:11286 18
ZAP= 1 Z= 16 A= 32 MT= 51 Author R.L.CLARKE,ET.AL. (64) 1964
E= 14.1000004 MeV xs= 54000.0000 mb +- 22000.0000 EXFOR ID:11286 18
ZAP= 1 Z= 11 A= 23 MT= 52 Author J.H.TOWLE,ET.AL. (62) 1962
E= 3.97000003 MeV xs= 180000.000 mb +- 15000.0000 EXFOR ID:21089 18
ZAP= 1 Z= 11 A= 23 MT= 52 Author J.H.TOWLE,ET.AL. (62) 1962
E= 3.97000003 MeV xs= 70000.0000 mb +- 8000.00000 EXFOR ID:21089 18
ZAP= 1 Z= 11 A= 23 MT= 52 Author J.H.TOWLE,ET.AL. (62) 1962
E= 3.97000003 MeV xs= 140000.000 mb +- 13000.0000 EXFOR ID:21089 18
ZAP= 1 Z= 11 A= 23 MT= 52 Author J.H.TOWLE,ET.AL. (62) 1962
E= 3.97000003 MeV xs= 100000.000 mb +- 9000.00000 EXFOR ID:21089 18
ZAP= 1 Z= 4 A= 9 MT= 16 Author X.C.CAO (62) 1962
E= 14.0000000 MeV xs= 540000.000 mb +- 162000.000 EXFOR ID:22616 2
ZAP= 1 Z= 47 A= 107 MT= 16 Author S.K.MUKHERJEE,ET.AL. (61) 1961
E= 14.8000002 MeV xs= 6500.00000 mb +- 0.00000000E+00 EXFOR ID:31161
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 19.6700001 MeV xs= 6020.00000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 19.6700001 MeV xs= 8140.00049 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 21.3999996 MeV xs= 26700.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 21.3999996 MeV xs= 30700.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 23.0300007 MeV xs= 64900.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 23.0300007 MeV xs= 65700.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 24.6700001 MeV xs= 78500.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 26.0799999 MeV xs= 79600.0000 mb +- 0.00000000E+00 EXFOR ID:C0829

ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 26.0799999 MeV xs= 111500.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 27.4699993 MeV xs= 89300.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 27.4699993 MeV xs= 105800.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 28.8099995 MeV xs= 111400.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 28.8099995 MeV xs= 123700.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 30.1499996 MeV xs= 114200.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 30.1499996 MeV xs= 115900.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 2004 Z= 20 A= 40 MT= 9000 Author P.C.ROGERS,ET.AL. (63) 1963
E= 30.1499996 MeV xs= 120800.0000 mb +- 0.00000000E+00 EXFOR ID:C0829
ZAP= 1001 Z= 49 A= 115 MT= 9000 Author V.V.VERBINSKI,ET.AL. (69) 1969
E= 18.2999992 MeV xs= 7190.00000 mb +- 0.00000000E+00 EXFOR ID:O0726
ZAP= 1 Z= 46 A= 110 MT= 16 Author R.L.WHITE,ET.AL. (72) 1972
E= 15.8999996 MeV xs= 4450.00000 mb +- 330.000000 EXFOR ID:10772 4
ZAP= 1 Z= 46 A= 110 MT= 16 Author R.L.WHITE,ET.AL. (72) 1972
E= 16.2999992 MeV xs= 4900.00000 mb +- 330.000000 EXFOR ID:10772 4
ZAP= 1 Z= 70 A= 176 MT= 16 Author J.JANCZYSZYN,ET.AL. (73) 1973
E= 14.0000000 MeV xs= 5800.00000 mb +- 3000.00000 EXFOR ID:30322 16
ZAP= 1001 Z= 5 A= 11 MT= 9000 Author G.M.RAISBECK,ET.AL. (71) 1971
E= 150.000000 MeV xs= 6900.00000 mb +- 1400.00000 EXFOR ID:C0230 2
ZAP= 1001 Z= 5 A= 11 MT= 9000 Author G.M.RAISBECK,ET.AL. (71) 1971
E= 600.000000 MeV xs= 4200.00000 mb +- 800.000000 EXFOR ID:C0230 2
ZAP= 1001 Z= 5 A= 11 MT= 9000 Author G.M.RAISBECK,ET.AL. (71) 1971
E= 150.000000 MeV xs= 19000.0000 mb +- 6000.00000 EXFOR ID:C0230 3
ZAP= 1001 Z= 5 A= 11 MT= 9000 Author G.M.RAISBECK,ET.AL. (71) 1971
E= 600.000000 MeV xs= 25000.0000 mb +- 8000.00000 EXFOR ID:C0230 3
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 6.07000017 MeV xs= 6780.00000 mb +- 740.000000 EXFOR ID:L0074 2
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 6.73000002 MeV xs= 10400.0000 mb +- 1700.00000 EXFOR ID:L0074 2
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 7.38000011 MeV xs= 10200.0000 mb +- 1100.00000 EXFOR ID:L0074 2
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 7.63999987 MeV xs= 10000.0000 mb +- 4300.00000 EXFOR ID:L0074 2
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 7.73000002 MeV xs= 9200.00000 mb +- 2600.00000 EXFOR ID:L0074 2
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 7.88000011 MeV xs= 11100.0000 mb +- 3400.00000 EXFOR ID:L0074 2
ZAP= 0 Z= 92 A= 0 MT= 18 Author O.Y.Mafra,ET.AL. (71) 1971
E= 7.90999985 MeV xs= 14300.0000 mb +- 1500.00000 EXFOR ID:L0074 2

ZAP= 0	Z= 92	A= 0	MT= 18	Author O.Y.Mafra,ET.AL. (71)	1971		
E= 9.00000000	MeV	xs= 37000.0000	mb +- 11000.0000	EXFOR ID:L0074	2		
ZAP= 0	Z= 90	A= 232	MT= 18	Author O.Y.Mafra,ET.AL. (71)	1971		
E= 6.73000002	MeV	xs= 8000.0000	mb +- 1300.0000	EXFOR ID:L0074	3		
ZAP= 0	Z= 90	A= 232	MT= 18	Author O.Y.Mafra,ET.AL. (71)	1971		
E= 7.63999987	MeV	xs= 5700.0000	mb +- 1100.0000	EXFOR ID:L0074	3		
ZAP= 0	Z= 90	A= 232	MT= 18	Author O.Y.Mafra,ET.AL. (71)	1971		
E= 7.88000011	MeV	xs= 4600.0000	mb +- 1800.0000	EXFOR ID:L0074	3		
ZAP= 0	Z= 90	A= 232	MT= 18	Author O.Y.Mafra,ET.AL. (71)	1971		
E= 7.90999985	MeV	xs= 5100.0000	mb +- 1400.0000	EXFOR ID:L0074	3		
ZAP= 0	Z= 90	A= 232	MT= 18	Author O.Y.Mafra,ET.AL. (71)	1971		
E= 9.00000000	MeV	xs= 8400.0000	mb +- 3500.0000	EXFOR ID:L0074	3		
ZAP= 1001	Z= 79	A= 197	MT= 9000	Author J.P.Alard,ET.AL. (75)	1975		
E= 600.000000	MeV	xs= 6550.0000	mb +- 0.00000000E+00	EXFOR ID:00046			
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.50000000	MeV	xs= 165000.000	mb +- 60000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.60000002	MeV	xs= 208000.000	mb +- 60000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.70000005	MeV	xs= 150000.000	mb +- 60000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.79999995	MeV	xs= 165000.000	mb +- 60000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 2.50000000	MeV	xs= 66000.0000	mb +- 35000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 3.00000000	MeV	xs= 50000.0000	mb +- 25000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.50000000	MeV	xs= 354000.000	mb +- 40000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.60000002	MeV	xs= 370000.000	mb +- 50000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.70000005	MeV	xs= 349000.000	mb +- 50000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.79999995	MeV	xs= 323000.000	mb +- 30000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 1.89999998	MeV	xs= 263000.000	mb +- 40000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 2.00000000	MeV	xs= 265000.000	mb +- 25000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 2.20000005	MeV	xs= 207000.000	mb +- 25000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 2.40000010	MeV	xs= 186000.000	mb +- 30000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 2.50000000	MeV	xs= 126000.000	mb +- 25000.0000	EXFOR ID:10876	5		
ZAP= 1	Z= 47	A= 107	MT= 51	Author A.SMITH,ET.AL. (79)	1979		
E= 3.00000000	MeV	xs= 59000.0000	mb +- 20000.0000	EXFOR ID:10876	5		

ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.60000002	MeV	xs=	209000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.70000005	MeV	xs=	274000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.79999995	MeV	xs=	278000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.89999998	MeV	xs=	193000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.00000000	MeV	xs=	244000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.20000005	MeV	xs=	236000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	197000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	154000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	318000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	210000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	205000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	189000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	172000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.60000002	MeV	xs=	257000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.70000005	MeV	xs=	256000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.79999995	MeV	xs=	304000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.89999998	MeV	xs=	246000.000	mb +- 35000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.00000000	MeV	xs=	230000.000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.20000005	MeV	xs=	192000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	159000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	113000.000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	128000.000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	85000.0000	mb +- 20000.0000	EXFOR	ID:10876	5

ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	58000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	48000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	42000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	26000.0000	mb +- 10000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.70000005	MeV	xs=	469000.000	mb +- 70000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.79999995	MeV	xs=	407000.000	mb +- 60000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.89999998	MeV	xs=	393000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.00000000	MeV	xs=	356000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.20000005	MeV	xs=	338000.000	mb +- 35000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	233000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	187000.000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	185000.000	mb +- 18000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	128000.000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	109000.000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	83000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	76000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	72000.0000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.59999990	MeV	xs=	82000.0000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	1.89999998	MeV	xs=	276000.000	mb +- 100000.000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.00000000	MeV	xs=	279000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.20000005	MeV	xs=	210000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	185000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	126000.000	mb +- 30000.0000	EXFOR	ID:10876	5

ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	117000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	98000.0000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	66000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	65000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	42000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	38000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	120000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	129000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	161000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	50000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	33000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	48000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	33000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.09999990	MeV	xs=	229000.000	mb +- 80000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	217000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	232000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	274000.000	mb +- 70000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	113000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	116000.000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	99000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	66000.0000	mb +- 18000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	60000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	112000.000	mb +- 40000.0000	EXFOR	ID:10876	5

ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	103000.000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	105000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	66000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	51000.0000	mb +- 18000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	33000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	27000.0000	mb +- 15000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	96000.0000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	73000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	74000.0000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	57000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	68000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	30000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	26000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.40000010	MeV	xs=	222000.000	mb +- 60000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	195000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	153000.000	mb +- 60000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	139000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	126000.000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	74000.0000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	57000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	42000.0000	mb +- 20000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.50000000	MeV	xs=	198000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.59999990	MeV	xs=	252000.000	mb +- 50000.0000	EXFOR	ID:10876	5

ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	155000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	132000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	93000.0000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	97000.0000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	62000.0000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.59999990	MeV	xs=	53000.0000	mb +- 25000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	2.79999995	MeV	xs=	278000.000	mb +- 80000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	250000.000	mb +- 60000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	269000.000	mb +- 80000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	186000.000	mb +- 60000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	196000.000	mb +- 60000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.59999990	MeV	xs=	118000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	162000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	90000.0000	mb +- 35000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	173000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.20000005	MeV	xs=	207000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	89000.0000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.50000000	MeV	xs=	150000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.59999990	MeV	xs=	180000.000	mb +- 50000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	100000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	102000.000	mb +- 30000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.00000000	MeV	xs=	143000.000	mb +- 40000.0000	EXFOR	ID:10876	5
ZAP= 1	Z= 47	A= 107	MT= 51	Author	A.SMITH,ET.AL. (79)	1979		
E=	3.40000010	MeV	xs=	139000.000	mb +- 40000.0000	EXFOR	ID:10876	5

ZAP= 1	Z= 79	A= 197	MT= 9000	Author G.A.PROKOPETS (80)	1980	
E= 20.6000004	MeV	xs= 57000.0000	mb +- 11400.0000	EXFOR ID:41102	9	
ZAP= 1	Z= 83	A= 209	MT= 9000	Author G.A.PROKOPETS (80)	1980	
E= 20.6000004	MeV	xs= 5450.0000	mb +- 1090.0000	EXFOR ID:41102	10	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 3.86899996	MeV	xs= 12126.0000	mb +- 56.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 4.32700014	MeV	xs= 12128.0000	mb +- 30.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 4.82999992	MeV	xs= 12258.0000	mb +- 23.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 5.33300018	MeV	xs= 12394.0000	mb +- 21.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 5.83699989	MeV	xs= 12561.0000	mb +- 20.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 6.34800005	MeV	xs= 12789.0000	mb +- 21.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 6.86999989	MeV	xs= 12990.0000	mb +- 21.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 7.40399981	MeV	xs= 13171.0000	mb +- 22.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 7.93599987	MeV	xs= 13391.0000	mb +- 24.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 8.38199997	MeV	xs= 13601.0000	mb +- 26.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 8.93599987	MeV	xs= 13854.0000	mb +- 28.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 9.47599983	MeV	xs= 14097.0000	mb +- 30.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 9.99199963	MeV	xs= 14318.0000	mb +- 32.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 10.5139999	MeV	xs= 14507.0000	mb +- 34.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 11.0389996	MeV	xs= 14775.0000	mb +- 36.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 11.5570002	MeV	xs= 15056.0000	mb +- 40.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 12.0880003	MeV	xs= 15380.0000	mb +- 41.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 12.6289997	MeV	xs= 15562.0000	mb +- 46.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 13.1739998	MeV	xs= 15730.0000	mb +- 47.5000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 13.7150002	MeV	xs= 15947.0000	mb +- 54.0000000	EXFOR ID:M0420	2	
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL. (80)	1980	
E= 14.2530003	MeV	xs= 16124.0010	mb +- 56.5000000	EXFOR ID:M0420	2	

ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	14.7799997	MeV	xs=	16302.9990	mb +- 63.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	15.2930002	MeV	xs=	16522.0000	mb +- 64.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	15.8400002	MeV	xs=	16683.0000	mb +- 67.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	16.4220009	MeV	xs=	16841.0000	mb +- 68.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	16.9769993	MeV	xs=	16924.0000	mb +- 78.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	17.5000000	MeV	xs=	17093.0000	mb +- 82.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	18.0779991	MeV	xs=	17188.0000	mb +- 84.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	18.6649990	MeV	xs=	17324.0000	mb +- 86.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	19.2859993	MeV	xs=	17412.0000	mb +- 90.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	19.8560009	MeV	xs=	17920.0000	mb +- 112.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	20.3700008	MeV	xs=	17850.0000	mb +- 112.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	20.9069996	MeV	xs=	17868.0000	mb +- 115.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	21.4680004	MeV	xs=	17903.0000	mb +- 117.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	22.0550003	MeV	xs=	18316.0000	mb +- 124.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	22.6700001	MeV	xs=	18362.0000	mb +- 127.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	23.3139992	MeV	xs=	18380.0000	mb +- 131.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	23.9890003	MeV	xs=	18791.0000	mb +- 136.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	24.6970005	MeV	xs=	18514.0000	mb +- 137.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	25.3120003	MeV	xs=	18709.0000	mb +- 176.0000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	25.8250008	MeV	xs=	18658.0000	mb +- 177.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	26.3549995	MeV	xs=	19156.0000	mb +- 187.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	26.9029999	MeV	xs=	19300.0000	mb +- 195.5000000	EXFOR	ID:M0420 2
ZAP= 0	Z= 73	A= 181	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	27.4699993	MeV	xs=	19408.0000	mb +- 206.5000000	EXFOR	ID:M0420 2

ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	3.86899996	MeV	xs=	14846.0000	mb +- 76.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	4.32700014	MeV	xs=	14781.0000	mb +- 44.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	4.82999992	MeV	xs=	14927.0000	mb +- 33.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	5.33300018	MeV	xs=	15091.0000	mb +- 30.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	5.83699989	MeV	xs=	15324.0000	mb +- 29.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	6.34800005	MeV	xs=	15624.0000	mb +- 31.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	6.86999989	MeV	xs=	15878.0000	mb +- 32.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	7.40399981	MeV	xs=	16100.0000	mb +- 33.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	7.93599987	MeV	xs=	16412.0000	mb +- 37.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	8.38199997	MeV	xs=	16810.0000	mb +- 39.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	8.93599987	MeV	xs=	17013.0000	mb +- 42.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	9.47599983	MeV	xs=	17402.0000	mb +- 45.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	9.99199963	MeV	xs=	17673.0000	mb +- 47.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	10.5139999	MeV	xs=	17945.0000	mb +- 50.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	11.0389996	MeV	xs=	18293.0000	mb +- 54.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	11.5570002	MeV	xs=	18583.0000	mb +- 58.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	12.0880003	MeV	xs=	19137.0000	mb +- 60.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	12.6289997	MeV	xs=	19244.0000	mb +- 66.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	13.1739998	MeV	xs=	19669.0000	mb +- 68.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	13.7150002	MeV	xs=	19861.0000	mb +- 76.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	14.2530003	MeV	xs=	20095.0000	mb +- 80.5000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	14.7799997	MeV	xs=	20165.0000	mb +- 89.0000000	EXFOR	ID:M0420 3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980	
E=	15.2930002	MeV	xs=	20299.0000	mb +- 90.5000000	EXFOR	ID:M0420 3

ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	15.8400002	MeV	xs=	20428.0000	mb +- 93.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	16.4220009	MeV	xs=	20738.0000	mb +- 94.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	16.9769993	MeV	xs=	21082.0000	mb +- 108.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	17.5000000	MeV	xs=	20972.0000	mb +- 112.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	18.0779991	MeV	xs=	21532.0000	mb +- 116.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	18.6649990	MeV	xs=	21395.0000	mb +- 118.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	19.2859993	MeV	xs=	21513.0000	mb +- 122.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	19.8560009	MeV	xs=	21905.0000	mb +- 146.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	20.3700008	MeV	xs=	22147.0000	mb +- 148.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	20.9069996	MeV	xs=	22286.0000	mb +- 154.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	21.4680004	MeV	xs=	22247.0000	mb +- 157.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	22.0550003	MeV	xs=	22589.0000	mb +- 161.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	22.6700001	MeV	xs=	22862.0000	mb +- 167.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	23.3139992	MeV	xs=	22906.0000	mb +- 170.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	23.9890003	MeV	xs=	23098.0000	mb +- 173.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	24.6970005	MeV	xs=	23348.0000	mb +- 182.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	25.3120003	MeV	xs=	23504.0000	mb +- 229.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	25.8250008	MeV	xs=	24074.0000	mb +- 239.5000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	26.3549995	MeV	xs=	24281.0000	mb +- 242.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	26.9029999	MeV	xs=	23803.0000	mb +- 247.0000000	EXFOR	ID:M0420	3
ZAP= 0	Z= 83	A= 209	MT= 3	Author N.K.SHERMAN,ET.AL.	(80)	1980		
E=	27.4699993	MeV	xs=	24142.0000	mb +- 250.999985	EXFOR	ID:M0420	3
ZAP= 1	Z= 41	A= 93	MT= 53	Author A.B.SMITH,ET.AL.	(82)	1982		
E=	4.00000000	MeV	xs=	11350.0000	mb +- 34.5000000	EXFOR	ID:12797	5
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL.	(90)	1990		
E=	62.7000008	MeV	xs=	8000.00000	mb +- 1600.00000	EXFOR	ID:A0569	3

ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 61.0999985		MeV xs= 8000.00000	mb +- 1600.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 59.5000000		MeV xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 57.7999992		MeV xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 56.0999985		MeV xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 54.4000015		MeV xs= 12000.0000	mb +- 2400.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 52.5999985		MeV xs= 11000.0000	mb +- 2200.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 50.7000008		MeV xs= 10000.0000	mb +- 2000.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 48.7999992		MeV xs= 11000.0000	mb +- 2200.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 46.9000015		MeV xs= 11000.0000	mb +- 2200.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 44.9000015		MeV xs= 12000.0000	mb +- 2400.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 42.7999992		MeV xs= 15000.0000	mb +- 3000.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 40.5999985		MeV xs= 14000.0000	mb +- 2800.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 38.2999992		MeV xs= 16000.0000	mb +- 3200.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 36.0000000		MeV xs= 15000.0000	mb +- 3000.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 33.5999985		MeV xs= 18000.0000	mb +- 3600.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 31.0000000		MeV xs= 22000.0000	mb +- 4400.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 28.3999996		MeV xs= 26000.0000	mb +- 5200.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 25.2999992		MeV xs= 29000.0000	mb +- 5800.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 22.2999992		MeV xs= 38000.0000	mb +- 7600.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 18.7000008		MeV xs= 90000.0000	mb +- 18000.0000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 14.3999996		MeV xs= 178000.000	mb +- 35600.0000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 114	MT= 4	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 9.19999981		MeV xs= 39000.0000	mb +- 7800.00000	EXFOR ID:A0569		3
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 63.9000015		MeV xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569		4

ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 62.5000000		MeV	xs= 10000.0000	mb +- 2000.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 61.0000000		MeV	xs= 10000.0000	mb +- 2000.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 59.5000000		MeV	xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 58.0000000		MeV	xs= 10000.0000	mb +- 2000.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 56.4000015		MeV	xs= 10000.0000	mb +- 2000.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 54.7999992		MeV	xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 53.2000008		MeV	xs= 11000.0000	mb +- 2200.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 51.5000000		MeV	xs= 10000.0000	mb +- 2000.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 49.7999992		MeV	xs= 12000.0000	mb +- 2400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 48.0999985		MeV	xs= 12000.0000	mb +- 2400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 46.2999992		MeV	xs= 12000.0000	mb +- 2400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 44.4000015		MeV	xs= 14000.0000	mb +- 2800.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 42.5999985		MeV	xs= 15000.0000	mb +- 3000.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 40.5999985		MeV	xs= 19000.0000	mb +- 3800.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 38.5999985		MeV	xs= 26000.0000	mb +- 5200.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 36.5000000		MeV	xs= 37000.0000	mb +- 7400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 34.2999992		MeV	xs= 47000.0000	mb +- 9400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 32.0000000		MeV	xs= 53000.0000	mb +- 10600.0000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 29.6000004		MeV	xs= 44000.0000	mb +- 8800.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 27.0000000		MeV	xs= 17000.0000	mb +- 3400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 24.1000004		MeV	xs= 24000.0000	mb +- 4800.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 21.2000008		MeV	xs= 37000.0000	mb +- 7400.00000	EXFOR ID:A0569	4
ZAP= 1001	Z= 48	A= 0	MT= 9000	Author N.G.ZAITSEVA,ET.AL. (90)	1990	
E= 17.8999996		MeV	xs= 9000.00000	mb +- 1800.00000	EXFOR ID:A0569	4

ZAP= 1	Z= 82	A= 208	MT= 9000	Author S.P.SIMAKOV,ET.AL. (92)	1992	
E= 14.1000004	MeV	xs= 5165.00000	mb +- 300.000000	EXFOR	ID:41156	8
ZAP= 1	Z= 83	A= 209	MT= 9000	Author S.P.SIMAKOV,ET.AL. (92)	1992	
E= 14.1000004	MeV	xs= 5220.00000	mb +- 310.000000	EXFOR	ID:41156	11
ZAP= 1	Z= 52	A= 122	MT= 103	Author P.M.GOPYCH,ET.AL. (94)	1994	
E= 14.6000004	MeV	xs= 16000.0000	mb +- 4000.00000	EXFOR	ID:41163	3
ZAP= 1	Z= 52	A= 124	MT= 103	Author P.M.GOPYCH,ET.AL. (94)	1994	
E= 14.6000004	MeV	xs= 10000.0000	mb +- 4000.00000	EXFOR	ID:41163	6
ZAP= 1	Z= 52	A= 126	MT= 103	Author P.M.GOPYCH,ET.AL. (94)	1994	
E= 14.6000004	MeV	xs= 4500.00000	mb +- 400.000000	EXFOR	ID:41163	7
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 9.80000019	MeV	xs= 12800.0000	mb +- 1.89999998	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 11.1999998	MeV	xs= 77600.0000	mb +- 8.60000038	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.1999998	MeV	xs= 183100.000	mb +- 16.5000000	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.0000000	MeV	xs= 284600.000	mb +- 21.8999996	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.8999996	MeV	xs= 368400.000	mb +- 27.6000004	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 14.6000004	MeV	xs= 447000.000	mb +- 31.3000011	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 233	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 15.5000000	MeV	xs= 449300.000	mb +- 35.9000015	EXFOR	ID:E1411	2
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 9.00000000	MeV	xs= 4600.00000	mb +- 1.50000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 10.1999998	MeV	xs= 39200.0000	mb +- 10.0000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 11.3999996	MeV	xs= 109900.000	mb +- 35.0000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.0000000	MeV	xs= 157600.000	mb +- 40.0000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.5000000	MeV	xs= 256000.000	mb +- 54.0000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.6000004	MeV	xs= 360100.000	mb +- 65.0000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 14.6000004	MeV	xs= 532000.000	mb +- 90.0000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 15.6000004	MeV	xs= 762900.000	mb +- 80.5000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 235	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 18.0000000	MeV	xs= 1199000.00	mb +- 110.000000	EXFOR	ID:E1411	3
ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 10.1999998	MeV	xs= 29800.0000	mb +- 11.0000000	EXFOR	ID:E1411	4
ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 11.1999998	MeV	xs= 70100.0000	mb +- 23.0000000	EXFOR	ID:E1411	4

ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.1000004	MeV	xs= 140100.000	mb +- 36.0000000	EXFOR	ID:E1411	4
ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.1000004	MeV	xs= 238900.000	mb +- 54.0000000	EXFOR	ID:E1411	4
ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 14.0000000	MeV	xs= 374800.000	mb +- 65.0000000	EXFOR	ID:E1411	4
ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 14.8000002	MeV	xs= 431200.000	mb +- 75.0000000	EXFOR	ID:E1411	4
ZAP= 1001	Z= 92	A= 236	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 15.6000004	MeV	xs= 695000.000	mb +- 85.0000000	EXFOR	ID:E1411	4
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 9.80000019	MeV	xs= 6700.00000	mb +- 3.50000000	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 11.1999998	MeV	xs= 44200.0000	mb +- 20.0999985	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.1999998	MeV	xs= 114200.000	mb +- 34.2000008	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.0000000	MeV	xs= 204600.000	mb +- 42.2999992	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.8999996	MeV	xs= 285300.000	mb +- 38.4000015	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 14.6000004	MeV	xs= 424600.000	mb +- 46.5000000	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 239	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 15.5000000	MeV	xs= 449000.000	mb +- 52.0000000	EXFOR	ID:E1411	5
ZAP= 1001	Z= 94	A= 242	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.0000000	MeV	xs= 598400.000	mb +- 85.0000000	EXFOR	ID:E1411	6
ZAP= 1001	Z= 94	A= 242	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 18.0000000	MeV	xs= 134700.000	mb +- 35.0000000	EXFOR	ID:E1411	6
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 10.1999998	MeV	xs= 16299.9990	mb +- 3.29999995	EXFOR	ID:E1411	7
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 11.6999998	MeV	xs= 56700.0000	mb +- 10.5000000	EXFOR	ID:E1411	7
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 12.0000000	MeV	xs= 64500.0000	mb +- 10.3000002	EXFOR	ID:E1411	7
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 13.1000004	MeV	xs= 92800.0000	mb +- 15.7999992	EXFOR	ID:E1411	7
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 14.3999996	MeV	xs= 123300.000	mb +- 20.0000000	EXFOR	ID:E1411	7
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 15.6000004	MeV	xs= 152400.000	mb +- 22.8000011	EXFOR	ID:E1411	7
ZAP= 1001	Z= 94	A= 244	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 18.0000000	MeV	xs= 342500.000	mb +- 44.5000000	EXFOR	ID:E1411	7
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 9.00000000	MeV	xs= 10200.0000	mb +- 3.29999995	EXFOR	ID:E1411	8
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991	
E= 10.0000000	MeV	xs= 28900.0000	mb +- 10.5000000	EXFOR	ID:E1411	8

ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 11.0000000		MeV xs= 72800.0000	mb +- 10.3000002	EXFOR	ID:E1411	8	
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 12.0000000		MeV xs= 187300.000	mb +- 15.7999992	EXFOR	ID:E1411	8	
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 13.6999998		MeV xs= 418800.000	mb +- 50.5000000	EXFOR	ID:E1411	8	
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 14.0000000		MeV xs= 455100.000	mb +- 20.0000000	EXFOR	ID:E1411	8	
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 15.5000000		MeV xs= 625300.000	mb +- 22.8000011	EXFOR	ID:E1411	8	
ZAP= 1001	Z= 95	A= 241	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 16.0000000		MeV xs= 671000.000	mb +- 44.5000000	EXFOR	ID:E1411	8	
ZAP= 1001	Z= 95	A= 243	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 10.3999996		MeV xs= 27500.0000	mb +- 10.5000000	EXFOR	ID:E1411	9	
ZAP= 1001	Z= 95	A= 243	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 12.0000000		MeV xs= 125300.000	mb +- 40.0000000	EXFOR	ID:E1411	9	
ZAP= 1001	Z= 95	A= 243	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 14.0000000		MeV xs= 202600.000	mb +- 62.7999992	EXFOR	ID:E1411	9	
ZAP= 1001	Z= 95	A= 243	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 15.6000004		MeV xs= 385500.000	mb +- 102.500000	EXFOR	ID:E1411	9	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 9.80000019		MeV xs= 49500.0000	mb +- 9.50000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 10.1999998		MeV xs= 65300.0039	mb +- 10.0000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 10.8000002		MeV xs= 142400.000	mb +- 18.5000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 11.1999998		MeV xs= 155500.000	mb +- 27.5000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 11.8999996		MeV xs= 233000.000	mb +- 30.3000011	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 12.6000004		MeV xs= 351500.000	mb +- 42.0000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 12.8000002		MeV xs= 339000.000	mb +- 44.0000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 13.1999998		MeV xs= 436600.000	mb +- 52.4000015	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 13.5000000		MeV xs= 505000.000	mb +- 65.5000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 13.6999998		MeV xs= 497500.000	mb +- 43.5000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 14.1999998		MeV xs= 576000.000	mb +- 76.5000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 14.3999996		MeV xs= 685000.000	mb +- 82.0000000	EXFOR	ID:E1411	10	
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991		
E= 14.6999998		MeV xs= 721000.000	mb +- 85.5000000	EXFOR	ID:E1411	10	

ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 15.1000004	MeV	xs= 854000.000	mb +- 111.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 15.5000000	MeV	xs= 890000.000	mb +- 98.0000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 16.5000000	MeV	xs= 981000.000	mb +- 117.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 17.5000000	MeV	xs= 1210000.00	mb +- 169.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 18.5000000	MeV	xs= 1217000.00	mb +- 158.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 19.5000000	MeV	xs= 1246000.00	mb +- 149.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 20.5000000	MeV	xs= 1365000.00	mb +- 204.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 21.6000004	MeV	xs= 1530000.00	mb +- 229.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 22.5000000	MeV	xs= 1651000.00	mb +- 198.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 23.6000004	MeV	xs= 1689000.00	mb +- 236.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 24.6000004	MeV	xs= 1668000.00	mb +- 215.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 25.5000000	MeV	xs= 1894000.00	mb +- 233.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 26.5000000	MeV	xs= 1815000.00	mb +- 246.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 27.5000000	MeV	xs= 1905000.00	mb +- 229.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 28.7999992	MeV	xs= 1874000.00	mb +- 225.000000	EXFOR	ID:E1411 10
ZAP= 1001	Z= 93	A= 237	MT= 18	Author T.Ohtsuki,ET.AL. (91)	1991
E= 32.0000000	MeV	xs= 1850000.00	mb +- 250.000000	EXFOR	ID:E1411 10
ZAP= 2004	Z= 23	A= 51	MT= 4	Author N.L.Singh,ET.AL. (95)	1995
E= 15.6000004	MeV	xs= 5600.00000	mb +- 672.000000	EXFOR	ID:O1116 2
ZAP= 1001	Z= 26	A= 0	MT= 9000	Author M.ENKE,ET.AL. (99)	1999
E= 1200.00000	MeV	xs= 5140.00000	mb +- 0.00000000E+00	EXFOR	ID:O0678
ZAP= 1001	Z= 79	A= 197	MT= 9000	Author M.ENKE,ET.AL. (99)	1999
E= 1200.00000	MeV	xs= 26700.0000	mb +- 0.00000000E+00	EXFOR	ID:O0678
ZAP= 1001	Z= 80	A= 0	MT= 9000	Author M.ENKE,ET.AL. (99)	1999
E= 1200.00000	MeV	xs= 28400.0000	mb +- 0.00000000E+00	EXFOR	ID:O0678
ZAP= 1001	Z= 82	A= 0	MT= 9000	Author M.ENKE,ET.AL. (99)	1999
E= 1200.00000	MeV	xs= 30400.0000	mb +- 0.00000000E+00	EXFOR	ID:O0678
ZAP= 2004	Z= 13	A= 27	MT= 29	Author S.Mukherjee,ET.AL. (97)	1997
E= 48.8600006	MeV	xs= 4400.00000	mb +- 308.000000	EXFOR	ID:O1180 2
ZAP= 2004	Z= 13	A= 27	MT= 29	Author S.Mukherjee,ET.AL. (97)	1997
E= 50.1699982	MeV	xs= 4800.00000	mb +- 384.000000	EXFOR	ID:O1180 2

ZAP= 2004 Z= 13 A= 27 MT= 29 Author S.Mukherjee,ET.AL. (97) 1997
E= 53.1800003 MeV xs= 5000.00000 mb +- 500.000000 EXFOR ID:O1180 2
ZAP= 2004 Z= 13 A= 27 MT= 29 Author S.Mukherjee,ET.AL. (97) 1997
E= 56.4500008 MeV xs= 4600.00000 mb +- 414.000000 EXFOR ID:O1180 2
ZAP= 2004 Z= 13 A= 27 MT= 29 Author S.Mukherjee,ET.AL. (97) 1997
E= 59.7099991 MeV xs= 4300.00000 mb +- 387.000000 EXFOR ID:O1180 2