**Nuclear Data Section**

**International Atomic Energy Agency**

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**Memo CP-D/1066**

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**To:** Distribution

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**Subject: JINR isomer cross sections and isomeric ratios separated in two entries**

During review of the isomeric ratio atlas under preparation by us, we found some isomer production cross sections and isomeric ratios from the same experiment at JINR are compiled in two different entries. To analyse the situation systematically, we checked the following combinations of the entries:

|  |  |  |  |
| --- | --- | --- | --- |
| Reaction | Incident energy | Isomer production cross sections | Isomeric ratio |
| p+Sn | 660 MeV | A0578 | O0988 |
| p+Sn | 3.65 GeV | A0853 | A0950 |
| d+Sn | 7.3 GeV | A0853 | A0950 |
| d+Au | 4.4 GeV | F1269 | F1299 |

and summarized the combinations of the isomer production cross sections and isomeric ratios in the table at the end of this memo. It would be better to compile them in the same EXFOR entry, otherwise users may be puzzled by appearance of very similar isomeric ratios in plots (See the plots appended to this memo).

Additionally, we found simple duplications of the datasets for Sn+p at 660 MeV:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Target | Proj. | Product | **Entry 1** | | **Entry 2** | |
| 112Sn | p | 102mRh | A0578.011 | 2.61(26) mb | O0988.003 | 2.61(39) mb |
| 112Sn | p | 102gRh | A0578.012 | 1.0(1) mb | O0988.003 | 1 (0.1) mb |
| 112Sn | p | 101gRh | A0578.013 | 4.56(50) mb | O0988.003 | 4.5 (5) mb |
| 112Sn | p | 101m/gRh | A0578.127 | 2.94(44) | O0988.044 | 2.94(44) |
| 124Sn | p | 95g/mNb | A0578.138 | 0.96(17) | O0988.058 | 0.96(17) |

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**Isomer production cross sections and isomeric ratios probably from the same experiment but compiled in two different entries**

**(A0578, A0853, A0950, F1269, F1299, O0988)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Target | Proj. | Product | E (MeV) | **Entry 1** | | | | | | **Entry 2** | | Remark |
| σg | | σm | | σm/σg | σg/σm | σm/σg or σg/σm | |
| 112Sn | p | 101Rh | 6.60E+08 | A0578.013 | 4.56E-03 | A0578.014 | 1.34E-02 | 2.94 |  | O0988.044 | 2.94 |  |
| 124Sn | p | 95Nb | 6.60E+08 | A0578.109 | 2.70E-04 | A0578.110 | 2.80E-04 |  | 0.96 | O0988.058 | 0.96 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 112Sn | p | 44Sc | 3.65E+09 | A0853.002 | 9.70E-04 | A0853.002 | 2.28E-03 | 2.35 |  | A0950.002 | 2.3 |  |
| 112Sn | p | 95Tc | 3.65E+09 | A0853.002 | 1.24E-02 | A0853.002 | 1.00E-03 |  | 12.4 | A0950.037 | 12.4 | M/G -> G/M in A0950.037 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 118Sn | p | 44Sc | 3.65E+09 | A0853.004 | 5.40E-04 | A0853.004 | 1.45E-03 | 2.69 |  | A0950.005 | 2.7 |  |
| 118Sn | p | 95Tc | 3.65E+09 | A0853.004 | 9.80E-03 | A0853.004 | 1.10E-03 |  | 8.9 | A0950.038 | 8.9 | M/G -> G/M in A0950.038 |
| 120Sn | p | 44Sc | 3.65E+09 | A0853.006 | 5.80E-04 | A0853.006 | 1.40E-03 | 2.41 |  | A0950.008 | 2.4 |  |
| 120Sn | p | 95Tc | 3.65E+09 | A0853.006 | 8.30E-03 | A0853.006 | 8.00E-04 |  | 10.4 | A0950.039 | 10.4 | M/G -> G/M in A0950.039 |
| 124Sn | p | 44Sc | 3.65E+09 | A0853.008 | 3.60E-04 | A0853.008 | 1.70E-03 | 4.72 |  | A0950.011 | 3.0 | Disagree |
| 124Sn | p | 95Tc | 3.65E+09 | A0853.008 | 7.50E-03 | A0853.008 | 5.60E-04 |  | 13.4 | A0950.040 | 13.4 | M/G -> G/M in A0950.040 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 112Sn | d | 44Sc | 7.30E+09 | A0853.010 | 1.70E-03 | A0853.010 | 2.90E-03 | 1.71 |  | A0950.003 | 1.7 |  |
| 118Sn | d | 44Sc | 7.30E+09 | A0853.012 | 2.00E-03 | A0853.012 | 3.20E-03 | 1.60 |  | A0950.006 | 1.6 |  |
| 118Sn | d | 95Tc | 7.30E+09 | A0853.012 | 1.23E-03 | A0853.012 | 1.51E-02 | 12.28 |  | A0950.041 | 12.3 |  |
| 120Sn | d | 44Sc | 7.30E+09 | A0853.014 | 1.50E-03 | A0853.014 | 2.70E-03 | 1.80 |  | A0950.009 | 1.8 |  |
| 124Sn | d | 44Sc | 7.30E+09 | A0853.016 | 1.50E-03 | A0853.016 | 2.00E-03 | 1.33 |  | A0950.012 | 1.3 |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| 197Au | d | 44Sc | 4.40E+09 | F1269.003 | 1.76E-03 | F1269.003 | 4.50E-04 | 0.26 |  | F1299.003 | 0.26 |  |
| 197Au | d | 102Rh | 4.40E+09 | F1269.003 | 3.85E-03 | F1269.003 | 1.32E-02 | 3.42 |  | F1299.006 | 3.41 |  |
| 197Au | d | 184Re | 4.40E+09 | F1269.003 | 9.20E-04 | F1269.003 | 4.09E-03 | 4.45 |  | F1299.007 | 4.45 |  |