

Adopted Levels:unobserved

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	B. Singh and A. Chakraborty		ENSDF	11-Jun-2013

S(n)=19360 SY; S(p)=-1830 SY; Q(α)=-6450 SY [2012Wa38](#)

Estimated uncertainties ([2012Wa38](#)): 1130 for S(n), 1060 for S(p) and Q(α).

S(2p)=1590 800, Q(ϵ p)=16990 800 (syst,[2012Wa38](#)). S(2n)=36.37 MeV (calculated,[1997Mo25](#)). Mass excess=-14350 800 (syst,[2012Au07](#)).

S(p): from their experimental data in [2005B110](#), [2013B104](#) deduced an upper limit of -350 keV for S(p)(^{53}Cu).

[2013B104](#): ^{53}Cu described as proton unbound nucleus from an analysis of results of their experiment carried out at GANIL and reported in [2005B115](#). Based on this analysis, S(p) and upper limit of half-life are deduced.

In previous Nuclear Data Sheets evaluation ([2009Hu15](#)) and NUBASE-2012 ([2012Au07](#)), ^{53}Cu is listed as identified based on a statement in [1994B1ZW](#) "in another measurement, the isotopes $^{53,54}\text{Cu}$ and ^{49}Co have been found to be unbound". However, in a follow-up [1994B110](#) publication, authors did not discuss this nuclide. On enquiry by one of the current evaluators, [2013B104](#) stated that nothing could be said about the ^{53}Cu nuclide in their [1994B110](#) paper. Instead, [2013B104](#) reanalyzed their [2005B115](#) experiment to set a limit on half-life and cross section, and published [2013B104](#) paper.

 ^{53}Cu Levels

E(level)	$T_{1/2}$	Comments
0?	<130 ns	$^{\%}p=?$ $T_{1/2}$: from 2013B104 , based on re-analysis of data in 2005B115 and flight time of 1.3 μs . J^{π} : $3/2^-$ from syst (2012Au07); $1/2^-$ in 1997Mo25 theoretical predictions. No experimental events due to ^{53}Cu were observed. Estimated production $\sigma=1\times 10^{-10}$ b in Ni($^{58}\text{Ni},X$),E=74.5 MeV/nucleon, which is consistent with non-observation of events related to ^{53}Cu nuclide. If this nuclide were bound, 2013B104 estimate that about 1250 events should have been detected in the above reaction.