

$^{64}\text{Zn}(t, ^3\text{He})$ 1977Sh08

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 178, 41 (2021).	12-Nov-2021

1977Sh08: E(t)=24 MeV. Measured ^3He spectra and $\sigma(\theta)$ using Q3D magnetic spectrometer at the Los Alamos three-stage electrostatic accelerator. FWHM=28 keV.

2009Hi08: E(t)=115 MeV/nucleon incident on a 9.84 mg/cm² thick 99.6% enriched ^{64}Zn foil. Outgoing ^3He particles were momentum analyzed in the S800 focal plane using two cathode-readout drift chambers (CRDC) and two plastic scintillators to measure energy loss and time of flight at the NSCL-MSU facility. Excitation energies of ^{64}Cu were obtained with missing mass calculations. A multipole decomposition analysis was used to isolate Gamow-Teller transitions. Measured differential cross sections, and deduced Gamow-Teller strength up to 14 MeV excitation. FWHM=280 keV. The $\sigma(\theta)$ data were analyzed using DWBA calculations with code FOLD. Comparison with shell-model calculations, and with (d, ^2He) experimental data for B(GT) strengths as a function of excitation energy.

 ^{64}Cu Levels

Gamow-Teller strengths for energy bins of 250 keV centred around the energies listed below and read from Fig. 3 in **2009Hi08**.

Energy Bin	B(GT)
0	0.06 2
130	0.08 2
380	0.11 3
640	0.04 3
860	0.11 6
1120	0.14 3
1370	0.07 8
2620	0.14 5
2870	0.12 3
3130	0.35 4
3380	0.14 3
3830	0.15 3
4120	0.10 3
4590	0.07 5
4850	0.13 3
5870	0.17 4
Summed	B(GT)=1.78 13

E(level) [†]	relative σ (30°) [†]
0	0.86
157 7	3.10
275 7	1.58
352 7	
566 7	2.78
604 7	1.56
739 7	
881 7	1.56
925 7	2.78
1235 7	
1293 7	2.13
1352 7	0.44
1436 7	0.98
1501 7	0.41
1548 7	9.76
1594 7	7.69

Continued on next page (footnotes at end of table)

${}^{64}\text{Zn}(t, {}^3\text{He})$ 1977Sh08 (continued) ${}^{64}\text{Cu}$ Levels (continued)

<u>E(level)[†]</u>	<u>J^π</u>	<u>L</u>	<u>relative σ (30°)[†]</u>	<u>Comments</u>
1698 7			23.8	
1770 7				
1847 7			0.43	
1913 7			0.51	
1975 7			1.46	
2065 7			5.68	
2138 7			2.50	
2260 7			6.29	
3.15×10^3 15	1 ⁺	0		E(level): binned data from 3.0 to 3.25 MeV (2009Hi08). L, J ^π : from 2009Hi08, weak presence of 2 ⁺ as in authors' Fig. 2.
11×10^3 1		1		E(level): binned data from 11 to 12 MeV (2009Hi08). L: from 2009Hi08.

[†] From 1977Sh08 unless otherwise stated.