Coulomb excitation 2018Wi09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

2018Wi09: beam=^{98}Zr at 464 MeV from CARIBU source at ATLAS-ANL facility. Target=^{196}Pt foil of 1.59 mg/cm^2 thickness. Recoiling particles were detected by CHICO2 array of segmented parallel-plate avalanche counter (PPAC). The γ rays were detected using the GRETINA array of segmented HPGe detectors. Measured Eγ, Iγ, recoils, (recoils)γ-coin, Coulomb excitation cross sections and yields. Deduced upper limit of B(E2) for the first 2$^+$ state in ^{98}Zr. Discussed shape coexistence. Comparison with shell-model calculations.

^{98}Zr Levels

E(level)†	J$^\pi$†	T$_{1/2}$	Comments
0.0	0$^+$		
854.1	0$^+$		
1222.9	2$^+$	2.4 ps *17*	T$_{1/2}$: deduced by evaluators from T$_{1/2}$≤4.1 ps and ≥0.68 ps, corresponding to B(E2)(W.u.)≥1.83 and ≤11, as listed in comments for 1222.9γ.

† From the Adopted Levels.

γ(^{98}Zr)

E$_i$(level)	J$_i^\pi$	E$_\gamma$†	I$_\gamma$‡	E$_f$	J$_f^\pi$	Mult.†	α#	Comments
1222.9	2$^+$	368.8	1.6 *2*	854.1	0$^+$	[E2]	0.0109	B(E2)(W.u.)≥11.5 and ≤71.3 (deduced by 2018Wi09 using Iγ(368.8)/Iγ(1222.9)=1.6 *2*/100 *5* taken from ^{98}Zr Adopted dataset in 2003Si07 evaluation of A=98. Iγ(368.8)/Iγ(1222.9)=2.5 *2*/100.0 *2* in the present Adopted dataset gives B(E2)(W.u.)≥18.1 and ≤109 (evaluators).
		1222.9	100 *5*	0.0	0$^+$	E2		B(E2)(W.u.)≥1.83 and ≤11 (lower limit from 2017An15 and upper limit from 2018Wi09). B(E2)(W.u.)=8.9 *20* or <11 (2018Wi09), the measured value is based on an estimated upper limit of 40 counts ascribed to the 1222.9 peak, and the uncertainty on the first value is mainly from beam composition, and with a 3σ significance limit. It should be noted that no peak corresponding to 1222.9 keV was observed by 2018Wi09, as the spectrum in this energy region was dominated by a 1230-keV γ-ray peak from the first 3$^-$ state to the first 2$^+$ state in ^{98}Mo.

† From the Adopted dataset.
‡ 2018Wi09 take values from 2003Si07 evaluation of A=98 nuclides.
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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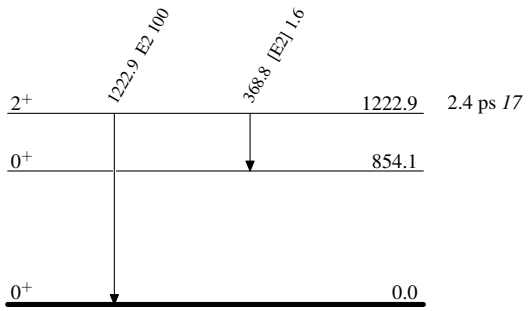
Level Scheme

Intensities: Relative photon branching from each level



$^{98}_{40}Zr_{58}$