^{1}H(^{57}Sc,2pγ) 2023Ch26

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	08-Sep-2023

Quasi-free one-proton knockout reaction.

2023Ch26: ^{1}H(^{57}Sc,2p),E(^{57}Sc)=209 MeV/nucleon, secondary ^{57}Sc beam from ^{9}Be(^{70}Zn,X),E(^{70}Zn)=345 MeV/nucleon, followed by separation and identification of ions of interest using the BigRIPS separator at RIBF-RIKEN facility. Measured reaction residues of ^{56}Ca through identification by the SAMURAI spectrometer, Doppler-corrected Eγ, Iγ, (particle)γ-coin spectra restricted to γ multiplicity of ≤5, using the DALI2^{+} array of NaI(Tl) detectors, and the MINOS liquid hydrogen (LH_2) target. Deduced energy of the first 2^{+} level, production cross sections, parallel momentum distributions for the g.s. and the first 2^{+} state. Comparison with shell-model calculations with the GXPF1B and A3DA-t Hamiltonians in full *pf* model space, and the state-of-the-art ab initio approaches: valence-space in-medium similarity renormalization group (VS-IMSRG) method, and coupled-cluster (C-C) calculations.

^{56}Ca Levels

E(level)	J$^{\pi}$	Comments
0	0^{+}	Measured partial cross section for the g.s.=0.80 mb *6*. Measured inclusive cross section for ^{56}Ca=1.23 mb *5*.
1456 *12*	(2^{+})	Measured partial cross section for the 1456,(2^{+}) level=0.43 mb *4*. J$^{\pi}$: from measured parallel momentum distributions, systematics of first 2^{+} energies in even-even Ca nuclei, and shell-model calculations (2023Ch26).

γ(^{56}Ca)

E$_\gamma$	E$_i$(level)	J$_i^{\pi}$	E$_f$	J$_f^{\pi}$
1456 *12*	1456	(2^{+})	0	0^{+}

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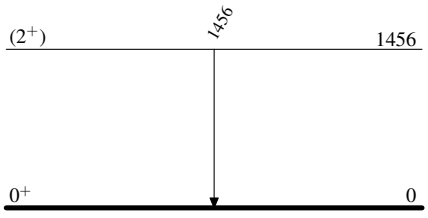
Level Scheme



$^{56}_{20}Ca_{36}$