^{70}Zn(pol p,p),(p,n):res 1974Ik01,1981Ab03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 188,1 (2023)	17-Jan-2023

1974Ik01: E=3.6-6.4 MeV, polarized beam from TUNL. Measured $\sigma(\theta)$ and analyzing power excitation functions and identified isobaric analog resonances in ^{71}Ga using two pairs of solid-state detectors (FWHM=30 keV). Optical model and R-matrix analysis.
1981Ab03: E=3.5-4.0 MeV from the CN accelerator of the Laboratori Nazionali di Legnaro (LNL-Padua). Measured excitation functions. Optical model and Breit-Wigner resonance analysis of IAR in ^{71}Ga.
1967Co04: E≈3.6-5.0 MeV from the Columbia University Van de Graaff. Measured total neutron yield from (p,n) reaction using a ^{3}He-filled proportional counter. Deduced resonance widths.
Other: 1972RaZI.

^{71}Ga Levels

Data indicate that other weak overlapping resonances are present in the 12600 to 12900 region (1974Ik01).

E(level)[†]	J$^{\pi}$[&]	Γ[a]	S′[c]	Comments
11590[#] *10*	1/2$^-$	20 keV *5*	0.66 *6*	E(level): IAR of ^{71}Zn g.s. E(p)=3781 *10*, Γ_p=4.1 keV *3*.
11671[‡] *3*	(3/2$^+$)[b]	2.0[b] keV *2*		E(p)=3863 *2*, Γ_p=0.075 keV *25*.
11702[‡] *3*	(3/2$^+$)[b]	7.0[b] keV *7*		E(p)=3894 *2*, Γ_p=0.6 keV *2*.
11728[‡] *3*	(3/2$^+$)[b]	0.50[b] keV *5*		E(p)=3921 *2*, Γ_p=0.035 keV *5*.
11740[‡] *3*	(3/2$^+$)[b]	4.0[b] keV *4*		E(p)=3933 *2*, Γ_p=0.15 keV *5*.
11885[#@] *10*		23 keV *5*		E(p)=4080 *10*.
12067[#@] *10*		34 keV *5*		E(p)=4265 *10*.
12264[#] *10*	3/2$^-$	39 keV *4*	0.24 *2*	E(level): IAR of 675 level in ^{71}Zn. E(p)=4464 *10*, Γ_p=2.2 keV *5*.
12453[#] *10*	5/2$^+$	15 keV *2*	0.58 *4*	E(level): IAR of 853 level in ^{71}Zn. E(p)=4656 *10*, Γ_p=1.1 keV *2*.
12862	5/2$^+$	19 keV *1*	0.17 *6*	E(level): IAR of 1261 level in ^{71}Zn. E(p)≈5071, Γ_p=0.6 keV *2*. E(level): data indicate other weak resonances may be present.
13012 *10*	3/2$^-$	11 keV *1*	0.064 *8*	E(level): IAR of 1421 level in ^{71}Zn. E(p)=5223 *10*, Γ_p=1.6 keV *2*.
13215 *10*	1/2$^+$	42 keV *2*	0.370 *10*	E(level): IAR of 1629 level in ^{71}Zn. E(p)=5429 *10*, Γ_p=13.7 keV *3*.
13267 *10*	5/2$^+$	38 keV *1*	0.972 *18*	E(level): IAR of 1661 level in ^{71}Zn. E(p)=5482 *10*, Γ_p=5.0 keV *1*.
13773 *10*	5/2$^+$	35 keV *5*	0.46 *6*	E(level): IAR of 2180 level in ^{71}Zn. E(p)=5995 *10*, Γ_p=3.3 keV *6*.
13918 *10*	1/2$^+$	55 keV *15*	0.25 *3*	E(level): IAR of 2377 level in ^{71}Zn. E(p)=6142 *10*, Γ_p=10.1 keV *15*.

[†] From E(level)=E(p)(c.m.)+S(p)(^{71}Ga), with S(p)(^{71}Ga)=7863.3 *21* (2021Wa16) and E(p)(c.m.) deduced from E(p) data of 1974Ik01 given here in lab coordinates, unless otherwise noted.
[‡] Components of the analog state of the second excited 286 state in ^{71}Zn; data reported in 1981Ab03.
[#] Levels seen also in (p,n) (1967Co04).
[@] Energy scale shifted downward by 12 keV to correct for possible shift compared to 1974Ik01.
[&] From polarized proton data of 1974Ik01, unless indicated otherwise.
[a] Resonance width from 1974Ik01, unless otherwise noted.
[b] From optical model plus Breit-Wigner resonance analysis (1981Ab03).
[c] Spectroscopic factors for neutron stripping to the IAR states in ^{71}Zn derived from R-matrix analysis (1974Ik01).