Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 126, 1 (2015)	31-Mar-2015

Q(β^-)=−11400 *40*; S(n)=12288 *7*; S(p)=4489 *7*; Q(α)=−4463 *7* 2012Wa38
S(2n)=29766 *29*, S(2p)=8761 *7*, Q(εp)=1937 *7* (2012Wa38).
1988Kr11: ^{40}Ca(^{12}C,^{9}Be), E=480 MeV ^{12}C beam at GANIL populated only the 19/2$^-$ 3066 keV level.
1987Th02: ^{42}Ca(pol p,π^-), measured cross section and analyzing power.
1983Wa05: ^{40}Ca(^{3}He,γ), E=3.19 MeV, measured σ(E,θ), deduced a broad resonance at level of 18.7 MeV *2* with Γ=3.1 MeV *3*.
1982Vi05: ^{42}Ca(p,π^-), measured cross section.
1974An36, 1972Sc21: ^{40}Ca(^{12}C,^{9}Be), E=114 MeV, measured σ.
Mass measurement: 2000HaZY, 1977Mu03, 1972Pr10.
Production cross section measurements: 1994Bl10.
Structure calculations: 2010Qi01, 2008Bo23, 2008Pe13, 2006Za08, 2003Ra45, 2001Ro13, 2000De10, 1999Ca12, 1997Bo47, 1992Po04.
Additional information 1.

^{43}Ti Levels

Cross Reference (XREF) Flags

A	^{44}Cr εp decay (42.8 ms)	D	^{40}Ca(^{6}Li,t)
B	Be(^{58}Ni,Xγ)	E	^{46}Ti(^{3}He,^{6}He)
C	^{40}Ca(α,nγ)		

E(level)[†]	J$^\pi$	$T_{1/2}$	XREF	Comments
0	7/2$^-$	509 ms *5*	ABCDE	%ε+%β^+=100; %εp=? μ=0.85 *2* (1993Ma67,2014StZZ) μ: β-NMR in Pt (1993Ma67,1993Ma72,1992Ma63). J$^\pi$: log *ft*=3.56 to 7/2$^-$ g.s. of ^{43}Sc (super-allowed transition). Mirror state of 7/2$^-$, g.s. in ^{43}Sc. $T_{1/2}$: from β activity in 1987Ho14. Others: 0.58 s *4* (1948Sc20), 0.58 s (1954Ty33), 0.56 s *2* (1961Ja22), 0.528 s *3* (1960Ja12), 0.50 s *2* (1962Pl02), 0.40 s *5* (1963Va37), 0.49 s *1* (1967Al08).
313.0 *10*	(3/2$^+$)	11.9 μs *3*	BC E	J$^\pi$: (3/2$^+$) proposed in (^{3}He,^{6}He) from similarity of $\sigma(\theta)$ pattern of 3/2$^+$ states, all believed to be from $d_{3/2}$ orbit, in ^{39}Ca, ^{47}Cr, ^{51}Fe and ^{55}Ni. Possible mirror state of 150, 3/2$^+$ level in ^{43}Sc. $T_{1/2}$: weighted average of 11.7 μs *3* (2011Ho02) and 12.6 μs *6* (1978Me15), both from γ(t).
475 *10*	(3/2$^-$)		DE	XREF: D(520). J$^\pi$: possible mirror state of 3/2$^-$, 472 level in ^{43}Sc.
998 *10*	(1/2$^+$)		C E	E(level): population of this level in (α,nγ) is uncertain. From energy matching, the strong group in (^{3}He,^{6}He) may correspond to 1022.4 from (α,nγ) (as proposed in 1990En08) but proposed J$^\pi$ assignments (1/2$^+$ for 998 in (^{3}He,^{6}He) and 5/2$^+$ for 1022 in (α,nγ)) disfavor this correspondence. J$^\pi$: (1/2$^+$) proposed in (^{3}He,^{6}He) from similarity of $\sigma(\theta)$ pattern of 1/2$^+$ states, all believed to be from d3/2 orbit, in ^{39}Ca, ^{47}Cr, ^{51}Fe and ^{55}Ni.
1022.4 *10*	(5/2$^+$)		A	J$^\pi$: possible mirror state of 5/2$^+$, 880 level in ^{43}Sc.
1160 *10*	(1/2 to 5/2)$^-$		DE	J$^\pi$: L(^{6}Li,t)=1 suggests 1/2$^-$,3/2$^-$,5/2$^-$.
1483.5 *10*	(7/2$^+$)		C E	J$^\pi$: possible mirror state of 7/2$^+$, 1337 level in ^{43}Sc.
1760 *30*	(1/2 to 5/2)$^-$		De	J$^\pi$: L(^{6}Li,t)=1 suggests 1/2$^-$,3/2$^-$,5/2$^-$.
1857.7 *10*	(11/2$^-$)		BCDe	J$^\pi$: L(^{6}Li,t)=(5) suggests 7/2$^-$ to 13/2$^-$. 11/2$^-$ is supported by yrast sequence (19/2$^-$) − (15/2$^-$) − (11/2$^-$) − 7/2 and probable mirror state of 11/2$^-$, 1830 level in ^{43}Sc.
2062.4 *10*	(9/2$^+$)		C	J$^\pi$: possible mirror state of 9/2$^+$, 1931 level in ^{43}Sc.

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Adopted Levels, Gammas (continued)

^{43}Ti Levels (continued)

E(level)†	Jπ	$T_{1/2}$	XREF	Comments
2250 *10*			DE	Jπ: L(^{6}Li,t)=3 suggests 3/2$^-$ to 9/2$^-$.
2438 *9*			E	
2640 *30*			D	Jπ: L(^{6}Li,t)=5 suggests 7/2$^-$ to 13/2$^-$.
2951.7 *10*	(15/2$^-$)		BCDE	XREF: E(2990). Jπ: L(^{6}Li,t)=7 suggests 11/2$^-$ to 17/2$^-$. 15/2$^-$ is supported by γ from (19/2$^-$) in an yrast sequence and probable mirror state of 15/2$^-$, 2987 level in ^{43}Sc.
3066.4 *10*	(19/2$^-$)	556 ns *6*	BC	μ=+7.22 *1* (1978Ha07,2014StZZ) Q=0.33 *8* (1981Da06,2014StZZ,2013StZZ) μ: TDPAD (1978Ha07). Q: TDPAD (1981Da06; original value of 0.30 *7* re-evaluated to 0.33 *8* by 2013StZZ. Jπ: from agreement of experimental μ with that calculated from shell-model with configuration=$\nu(f^3_{7/2}+f^2_{7/2}f_{5/2})$. Probable mirror state of (19/2$^-$), 3123 level in ^{43}Sc with $T_{1/2}$=472 ns *4*. $T_{1/2}$: weighted average of 551 ns *7* (2011Ho02), 560 ns *6* (1978Ha07), 553 ns *21* (1981Da06), 560 ns *35* (1978Me09); from γ(t).
3220 *30*			D	Jπ: L(^{6}Li,t)=(9) suggests 15/2$^-$ to 21/2$^-$.

† From (α,nγ). From (^{3}He,^{6}He) when a level is not populated in γ-ray study.

γ(^{43}Ti)

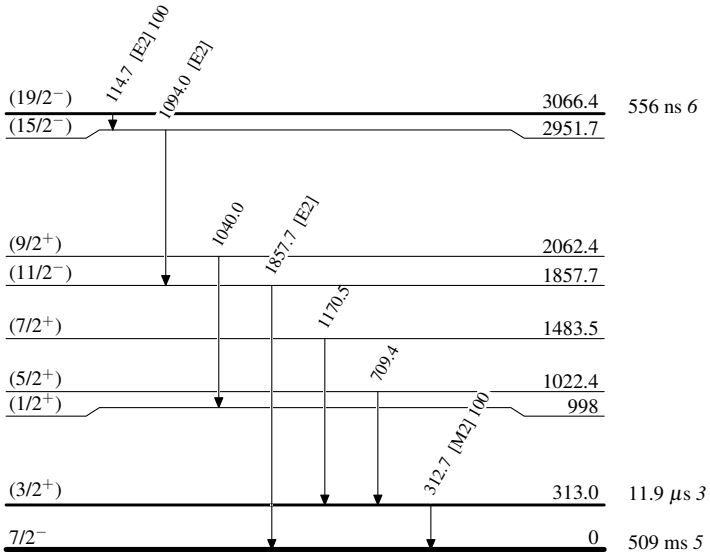
E_i(level)	J^π_i	E_γ†	I_γ	E_f	J^π_f	Mult.	Comments
313.0	(3/2$^+$)	312.7 *2*	100	0	7/2$^-$	[M2]	B(M2)(W.u.)=0.0710 *18* E_γ: from Be(^{58}Ni,Xγ).
1022.4	(5/2$^+$)	709.4		313.0	(3/2$^+$)		
1483.5	(7/2$^+$)	1170.5		313.0	(3/2$^+$)		
1857.7	(11/2$^-$)	1857.7		0	7/2$^-$	[E2]	
2062.4	(9/2$^+$)	1040.0		998	(1/2$^+$)		
2951.7	(15/2$^-$)	1094.0		1857.7	(11/2$^-$)	[E2]	
3066.4	(19/2$^-$)	114.7	100	2951.7	(15/2$^-$)	[E2]	B(E2)(W.u.)=5.7 *3*

† From (α,nγ) unless otherwise noted.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{43}_{22}Ti_{21}$