^{45}Sc(p,n),(p,nγ)

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows	NDS 109,171 (2008)	30-Oct-2007

Target $J^\pi=7/2^-$.

1968Je03: energy not given. Cyclotron. Ge(Li), Si(Li), and curved-crystal spect.

1970Iy01: E(p)=2.8-5.6 MeV. Measured n′s and n(θ=0°−135°) (tof,scin) and γ′s and γ(θ=0°,30°,60°,90°) Hauser-Feshbach calculations.

1970Ly02: E(p)=6, 7.5 MeV. Measured γ(t); Ge(Li), scin.

1971Iy02: E(p)=4.45-5.90 MeV. Measured E(n), σ(Eγ,E(n),$\theta(\gamma)$); tof. DSAM.

1972Zu02: E(p)=3.35-4.50 MeV. Measured γ′s, $\gamma(\theta)$. DSAM.

1976Wh01: E(p)=3.5-5 MeV. Measured γ(t).

1980Ch13: E(p)=3.6 and 4.0 MeV. Measured γ′s and $\gamma\gamma$- and nγ-coincidences. Ge(Li), scin.

1985Av04: see ^{45}Sc ^{45}Sc(p,p′γ) for details.

Others: see 1992Bu01.

^{45}Ti Levels

See 1970Iy01 for suggested J^π deduced from comparison to Hauser-Feshbach calculations.

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J          TV   From the Adopted Levels. Contributing arguments from     these data are:
Ex         Jπ
1354     9/2−   TVγ(θ)      and M1+E2 γ  to 7/2−
1468    11/2−   TVγ(θ)      and E2+M3 γ  to 7/2−
1882     9/2+   TVγ(θ)      and E2(+M3) γ  to 5/2+
2016   ≤11/2    TVγ(θ)
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E(level)†	Jπ	$T_{1/2}$‡	E(level)†	Jπ	$T_{1/2}$‡
0.0	7/2−		1521.0 *10*	3/2− to 9/2−	48@ fs *11*
36.7 *3*	3/2−	3.1# μs *3*	1799.2 *25*	(1/2− to 7/2−)	0.32 ps +*22*−*8*
40.1 *3*	5/2−	11.9#@ ns *7*	1881.9 *8*	9/2+	0.62 ps +*21*−*14*
329.5 *3*	3/2+	1.099@& ns *13*	1957.9 *18*	3/2+	
743.9 *3*	5/2+	≥1 ps	2016.0 *10*	3/2− to 9/2−	32 fs *9*
1226.9 *5*	7/2+	≥1.5 ps	2259.8 *21*	5/2+	
1354.1 *8*	9/2−	103@ fs *9*	2432.1 *20*	3/2 to 11/2	
1468.0 *10*	11/2−	0.48@ ps *7*			

† From least-squares fit to Eγ′s. Eγ Eγ(to 40)−3.3 *3*, excluded from least-squares analysis.

‡ From DSAM (1971Iy02), except as noted.

From γ(t) (1970Ly02). $T_{1/2}$(40) weighted average from (p,nγ), E(p)=6 MeV, and (α,nγ), Eα=10 MeV.

@ See 1992Bu01 for other $T_{1/2}$ measurements.

& From γ(t) (1976Wh01).

^{45}Sc(p,n),(p,nγ) (continued)

γ(^{45}Ti)

RI(F) Unweighted average of the following branching ratios:

E_x	E_g	1968Je03	1970Iy01	1971Iy02	1972Zu02	1980Ch13	1985Av04
744	414	85 *5*	94 *2*	94 *1*	90 *1*	90.6 *9*	90 *5*	
	704				2.4 *4*			
		15 *5*	6 *2*	6 *1*	10 *1*	10.0 *5*		
	707				6.8 *7*			
	744				0.2 *1*			
1227	483	31 *5*	53 *2*	46 *1*	53 *2*	51 *3*		
	897	32 *5*	37 *2*	45 *1*	37 *2*	34.0 *17*		
	1187	23 *5*	6 *2*	5 *2*	5 *1*	10.0 *5*		
	1227	14 *5*	4 *2*	4 *2*	5 *1*	5.0 *3*		
1354	1314	6 *5*	7 *1*	9 *1*		7.0 *4*		
	1354	94 *5*	93 *1*	91 *1*		93 *5*		
1521	1484	83 *2*					32.0 *17*	
	1521	17 *2*					68 *4*	

E_i(level)	J_i^π	E_γ[†]	I_γ[†‡]	E_f	J_f^π	Mult.[#]	δ[#]	Comments
36.7	3/2⁻	36.68[@] *30*	100[@]	0.0	7/2⁻			2<α(exp)<20, from Iγ(37γ) and Iγ(292γ) measured just above the production threshold for the 330-keV state (1968Je03).
40.1	5/2⁻	40.15[@] *30*	100[@]	0.0	7/2⁻			
329.5	3/2⁺	289.5[a] *3*	0.55[&] *25*	40.1	5/2⁻			
		292.77[@] *5*	99.45[&] *25*	36.7	3/2⁻			
743.9	5/2⁺	414.45[@] *10*	90.3 *14*	329.5	3/2⁺	*b*		
		703.9[a] *11*	2.5 *5*	40.1	5/2⁻			
		707.2[@] *10*	7.0 *12*	36.7	3/2⁻			
		744	0.2 *1*	0.0	7/2⁻			E_γ: from 1980Ch13.
1226.9	7/2⁺	483 *1*	47 *4*	743.9	5/2⁺			
		897 *1*	36.9 *23*	329.5	3/2⁺			
		1187 *1*	10 *4*	40.1	5/2⁻			
		1227 *1*	6.4 *19*	0.0	7/2⁻	D+Q		δ: 0.00 *3* or +1.60 *6* (1985Av04). Mult.,δ: from γ(θ).
1354.1	9/2⁻	1314 *1*	7.2 *7*	40.1	5/2⁻			
		1354 *1*	92.8 *7*	0.0	7/2⁻	M1+E2[c]	−0.34[c] *12*	
1468.0	11/2⁻	1468 *1*	100	0.0	7/2⁻	E2+M3[c]	+0.09[c] *7*	
1521.0	3/2⁻ to 9/2⁻	1484[edf] *1*	58[e] *26*	40.1	5/2⁻			
		1484[edf] *1*	58[e] *26*	36.7	3/2⁻			
		1521 *1*	42 *26*	0.0	7/2⁻			
1799.2	(1/2⁻ to 7/2⁻)	1761[edf] *2*	100[e]	40.1	5/2⁻			
		1761[edf] *2*	100[e]	36.7	3/2⁻			
1881.9	9/2⁺	655 *1*	28 *1*	1226.9	7/2⁺			

$^{45}_{22}Ti_{23}$-2

^{45}Sc(p,n),(p,nγ) (continued)

γ(^{45}Ti) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†‡]	E_f	J_f^π	Mult.[#]	δ[#]
1881.9	9/2$^+$	1138 *1*	72 *1*	743.9	5/2$^+$	E2(+M3)[c]	+0.3[c] *3*
1957.9	3/2$^+$	1214 *2*	100	743.9	5/2$^+$		
2016.0	3/2$^-$ to 9/2$^-$	1976[edf] *1*	53[e] *1*	40.1	5/2$^-$		
		1976[edf] *1*	53[e] *1*	36.7	3/2$^-$		
		2016 *1*	47 *1*	0.0	7/2$^-$		
2259.8	5/2$^+$	302 *2*		1957.9	3/2$^+$		
		1930 *3*		329.5	3/2$^+$		
2432.1	3/2 to 11/2	2394[edf] *3*	20[e] *10*	40.1	5/2$^-$		
		2394[edf] *3*	20[e] *10*	36.7	3/2$^-$		
		2432 *2*	80 *10*	0.0	7/2$^-$		

† From 1971Iy02, except as noted.
‡ % photon branching from each level.
# From γ(θ) (1971Iy02), except as noted.
@ From 1968Je03.
& From 1980Ch13.
[a] From Eγ(to 40)−3.3 *3*. 1980Ch13 observed a small peak 3.3 keV 3 below the 292γ and confirmed its existence in γγ-coin in ^{42}Ca(α,nγ).
[b] Isotropic distribution at E(p)=3.85 MeV (1970Iy01).
[c] From γ(θ) and comparison to RUL (1971Iy02).
[d] Possible doublet (evaluator).
[e] Multiply placed with undivided intensity.
[f] Placement of transition in the level scheme is uncertain.

$^{45}_{22}Ti_{23}$-3

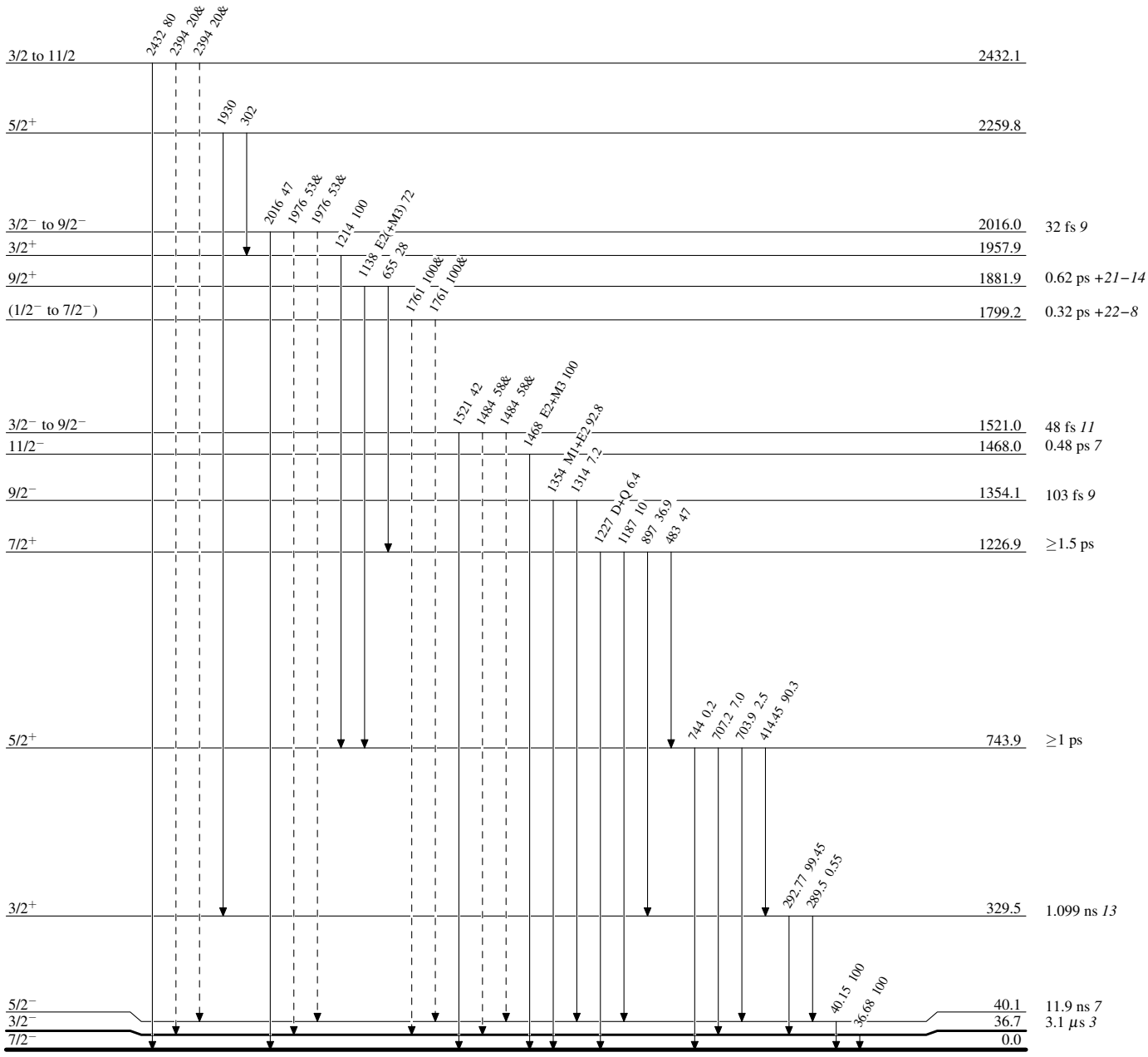
^{45}Sc(p,n),(p,nγ)

Legend

Level Scheme

Intensities: % photon branching from each level
& Multiply placed: undivided intensity given

– – – – – – ► γ Decay (Uncertain)



$^{45}_{22}Ti_{23}$