

$^{45}\text{Sc}(\text{n},\text{n}'),(\text{n},\text{n}'\gamma)$

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

1969Ro21: E=0.45-1.8 MeV. Measured γ 's. Hauser-Feshbach.

1971Ba57: E=1.1-1.4 MeV. Measured excitation functions, N's (tof,scin), γ 's. Hauser-Feshbach.

1973Ro26: E=1.41 and 1.75 MeV. Measured γ 's and $\gamma(\theta)$.

1989Ge09,1983El03: fast reactor spectrum (thermal N's suppressed by Cd and B₄C filters; reactor γ 's by Pb). Two-target DSAM.

1993Sm02: E=1.5-10 MeV. Measured $\sigma(\theta(\text{C.M.})=20^\circ-160^\circ)$; tof. Presented angle-integrated results averaged over ≈ 100 keV.

 ^{45}Sc Levels

E(level)	J^π [†]	$T_{1/2}$ [‡]	Comments
0.0 [#]	7/2 ⁻		
(12.40 ^{†#} 5)	3/2 ⁺		
376.8 [#] 4	3/2 ⁻ @		
543.1 [#] 4	5/2 ⁺ @	>0.38 ps	
720.3 5	5/2 ⁻ @	0.15 ps 10	E(level): other: 737 20 (1993Sm02).
939.1 [#] 5	1/2 ⁺	<0.97 ps	
974.7 [#] 5	7/2 ⁺ &	>0.42 ps	
1067.6? [#] 7	3/2 ⁻		
1236.4 [#] 15	11/2 ⁻ &	0.12 ps 8	
(1303.18 ^{†#} 15)	3/2 ⁺		
1407.0 [#] 20	(7/2) ⁻	0.28 ps 14	
1436.3 [#] 10	9/2 ⁺		$T_{1/2} > 5.5$ fs < 62 fs
1472.8? 10	(7/2 ⁺) ^a		
(1556.2 ^{†#} 5)	(3/2) ⁻		
1662.7 [#] 15	9/2 ⁻	0.13 ps 9	
1800 [#]	5/2 ⁺	0.045 ps 7	
2094	5/2	0.021 ps 9	
2223	5/2 ⁺ , 7/2 ⁺	0.069 ps 14	
2304	(5/2 ⁻)	0.83 ps 83	
2343	(7/2 ⁻)	0.046 ps 11	$T_{1/2}$: see footnote on the 2341 and 2352 states In the Adopted Levels.
2780	(1/2 ⁻ , 3/2, 5/2)	0.069 ps 14	

[†] From the Adopted Levels. Contributing spin and parity arguments from these data are given As footnotes. 12.40-keV level energy held fixed In least-squares adjustment.

[‡] From two-target DSAM (1989Ge09); includes corrections for moderating ability of material.

[#] Unresolved by 1993Sm02. Energies observed were 0.0, 465 23, 1017 34, 1250 20, 1432 23, and 1691 25.

@ Hauser-Feshbach analysis (1971Ba57,1969Ro21) consistent with adopted J^π .

& From $\gamma(\theta)$ (1973Ro26) and E2 γ to 3/2⁺.

^a From Hauser-Feshbach analysis (1971Ba57,1969Ro21). 1969Ro21 note that the Hauser-Feshbach analysis is not conclusive.

$^{45}\text{Sc}(n,n'),(n,n'\gamma)$ (continued)

$\gamma(^{45}\text{Sc})$								
$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\ddagger	E_f	J_f^π	Mult. [#]	δ	Comments
376.8	$3/2^-$	363.8 5	100	12.40?	$3/2^+$	(E1(+M2))	-0.01 8	Mult., δ : from the Adopted Gammas. E1 assumed by 1973Ro26.
		377.3 5	6	0.0	$7/2^-$			
543.1	$5/2^+$	530.6 5	100	12.40?	$3/2^+$	D		
		543.2 5	67	0.0	$7/2^-$	D		
720.3	$5/2^-$	720.3 5	100	0.0	$7/2^-$			
939.1	$1/2^+$	926.7 5	100	12.40?	$3/2^+$			
974.7	$7/2^+$	431.8 ^b 5	≈ 0	543.1	$5/2^+$			placed by evaluator based on the Adopted Gammas.
		962 1	62	12.40?	$3/2^+$	E2 [@]		
		974.8 5	100	0.0	$7/2^-$	D+Q		
1067.6?	$3/2^-$	347.3 ^b 5		720.3	$5/2^-$			not observed In the background but 1973Ro26 considered the origin As uncertain.
1236.4	$11/2^-$	1235 2	100	0.0	$7/2^-$	E2 [@]		
1407.0	$(7/2)^-$	1407 2	100	0.0	$7/2^-$			
1436.3	$9/2^+$	893 1		543.1	$5/2^+$			
		1437 2		0.0	$7/2^-$			
1472.8?	$(7/2^+)$	752 ^{ab} 1	^a	720.3	$5/2^-$			
		1474 ^{ab} 2	^a	0.0	$7/2^-$			
1662.7	$9/2^-$	426 1	54 ^{&}	1236.4	$11/2^-$			
		1664 2	100 ^{&}	0.0	$7/2^-$			
1800	$5/2^+$	1788		12.40?	$3/2^+$			
2094	$5/2$	2094		0.0	$7/2^-$			
2223	$5/2^+, 7/2^+$	1503		720.3	$5/2^-$			
2304	$(5/2^-)$	2292		12.40?	$3/2^+$			
2343	$(7/2^-)$	2343		0.0	$7/2^-$			
2780	$(1/2^-, 3/2, 5/2)$	2403		376.8	$3/2^-$			

[†] From 1971Ba57 for $E(\text{level}) < 1.41$ MeV, 1973Ro26 for 1.41 MeV $< E(\text{level}) < 1.7$ MeV and 1989Ge09 for $E(\text{level}) > 1.7$ MeV, except As noted.

[‡] From 1969Ro21, except As noted. Relative photon branching ratio from each level.

[#] From $\gamma(\theta)$ (1973Ro26). $364\gamma(\theta)$ was used As an internal standard.

[@] From $\gamma(\theta)$ (1973Ro26) and comparison to RUL.

[&] From 1973Ro26.

^a E_γ from 1969Ro21. I_γ 's were not given by 1969Ro21 due to large statistical uncertainties.

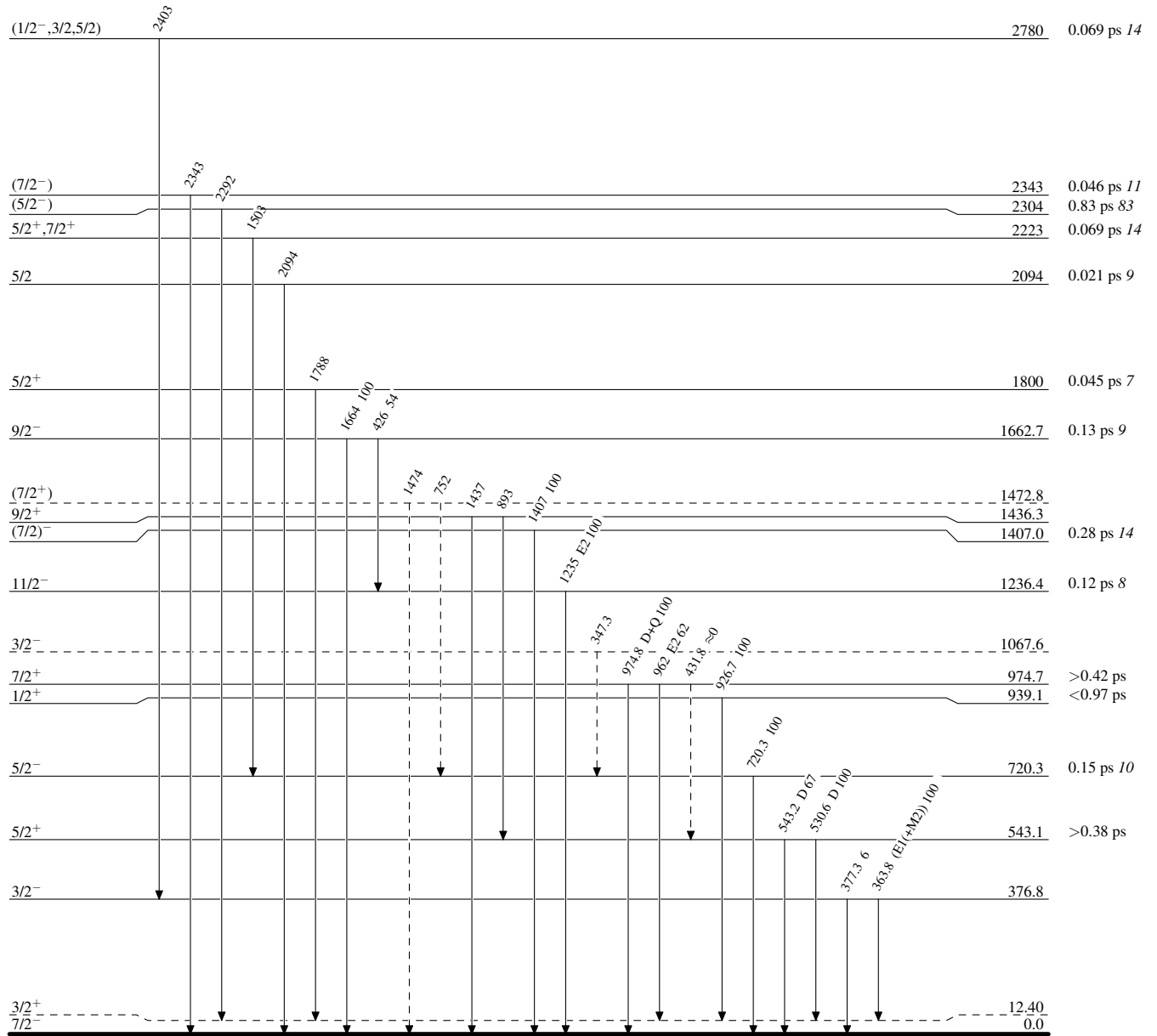
^b Placement of transition in the level scheme is uncertain.

$^{45}\text{Sc}(n,n'),(n,n'\gamma)$

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{45}\text{Sc}_{24}$