

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Wang Jimin and Huang Xiaolong		NDS 144, 1 (2017)	1-Mar-2016

$Q(\beta^-)=6504\ 20$; $S(n)=6753\ 25$; $S(p)=10928\ 20$; $Q(\alpha)=-9942\ 20$ [2017Wa10](#)

Other Reactions:

$^{51}\text{V}(e,\pi^+)$ ([1988Sh35](#)): $E=200\ \text{MeV}$; measured π^+ spectra, $\sigma(E(\pi),\theta(\pi))$.

 ^{51}Sc Levels

For shell-model calculations, see [1986Ku01](#), [2005Br18](#).

Cross Reference (XREF) Flags

A	$^{51}\text{Ca}\ \beta^-$ decay	D	$^{48}\text{Ca}(^{238}\text{U},X\gamma)$
B	$^{48}\text{Ca}(\alpha,p)$	E	$^{208}\text{Pb}(^{48}\text{Ca},X\gamma)$
C	$^{48}\text{Ca}(^{48}\text{Ca},X\gamma)$		

E(level) [‡]	J ^π	T _{1/2}	XREF	Comments
0.0 [†]	(7/2) ⁻	12.4 s <i>I</i>	AB CDE	$\% \beta^- = 100$; $\% \beta^- n = ?$ J ^π : $\pi = -$ from $\log ft = 5.214\ 17$ to $5/2^-$, $J = (7/2)$ from $L = (3)$ and shell model in $^{48}\text{Ca}(\alpha,p)$. T _{1/2} : from γ multiscaling in 1976Da16 . Other: 12.5 s <i>I</i> (1966Bi09).
861.62 <i>10</i>	(3/2) ⁻ [#]		AB D	
1064 [†] <i>3</i>	(11/2) ⁻	19 ps <i>5</i>	BCDE	J ^π : E2 γ to (7/2) ⁻ , $L = (5)$ in $^{48}\text{Ca}(\alpha,p)$. T _{1/2} : from recoil-distance Doppler-shift method (RDDS, 2009Va06).
1167.33 <i>20</i>	(3/2,5/2,7/2 ⁺)		A D	J ^π : $\log ft = 6.9\ 3$ and $\log f^{lu}_t = 8.9$ from (3/2) ⁻ , γ to (7/2) ⁻ .
1394.02 <i>17</i>	(3/2,5/2)		AB D	J ^π : $\log ft = 6.08\ 7$ from (3/2) ⁻ , γ to (7/2) ⁻ ; $\log f^{lu}_t < 8.5$ eliminates 7/2 ⁺ .
1715.02 <i>19</i>			A D	XREF: D(1712).
2313 <i>10</i>			B	
2347.2 <i>4</i>	(1/2) ⁻ [#]		AB	
2708.8 <i>3</i>	(3/2) ⁻ [#]		AB	
2887 <i>7</i>			B	
2996 <i>7</i>			B	
3038.69 <i>23</i>	(3/2 ⁻ ,5/2 ⁻)		AB D	XREF: D(3034). J ^π : $\log ft = 5.33\ 7$ from (3/2) ⁻ , γ to (7/2) ⁻ .
3069 <i>7</i>			B	
3195.2 <i>4</i>	(3/2 ⁻ ,5/2 ⁻)		AB D	XREF: D(3193). J ^π : $\log ft = 5.14\ 7$ from (3/2) ⁻ , γ to (7/2) ⁻ .
3390.6 <i>6</i>	(1/2,3/2,5/2)		A	J ^π : $\log ft = 5.89\ 9$ from (3/2) ⁻ .
3772.1 <i>6</i>	(3/2 ⁻ ,5/2 ⁻)		A	J ^π : $\log ft = 5.44\ 8$ from (3/2) ⁻ , γ to (7/2) ⁻ .
3881.1 [†]	(15/2) ⁻		CD	XREF: D(3875).
4825.6 [†]	(15/2) ⁻ [@]		C	
5540.2 [†]	(17/2 ⁺) [@]		C	
6184.0 [†]	(19/2 ⁺) [@]		C	

[†] Seq.(A): Strongly populated γ -ray sequence.

[‡] For states connected by gammas, E(level)'s are from a least-squares fit to $E\gamma$.

[#] From $\sigma(\theta)$ DWBA analysis for L transfer and shell-model analysis in $^{48}\text{Ca}(\alpha,p)$.

[@] From shell model calculations ([2005Br18](#)).

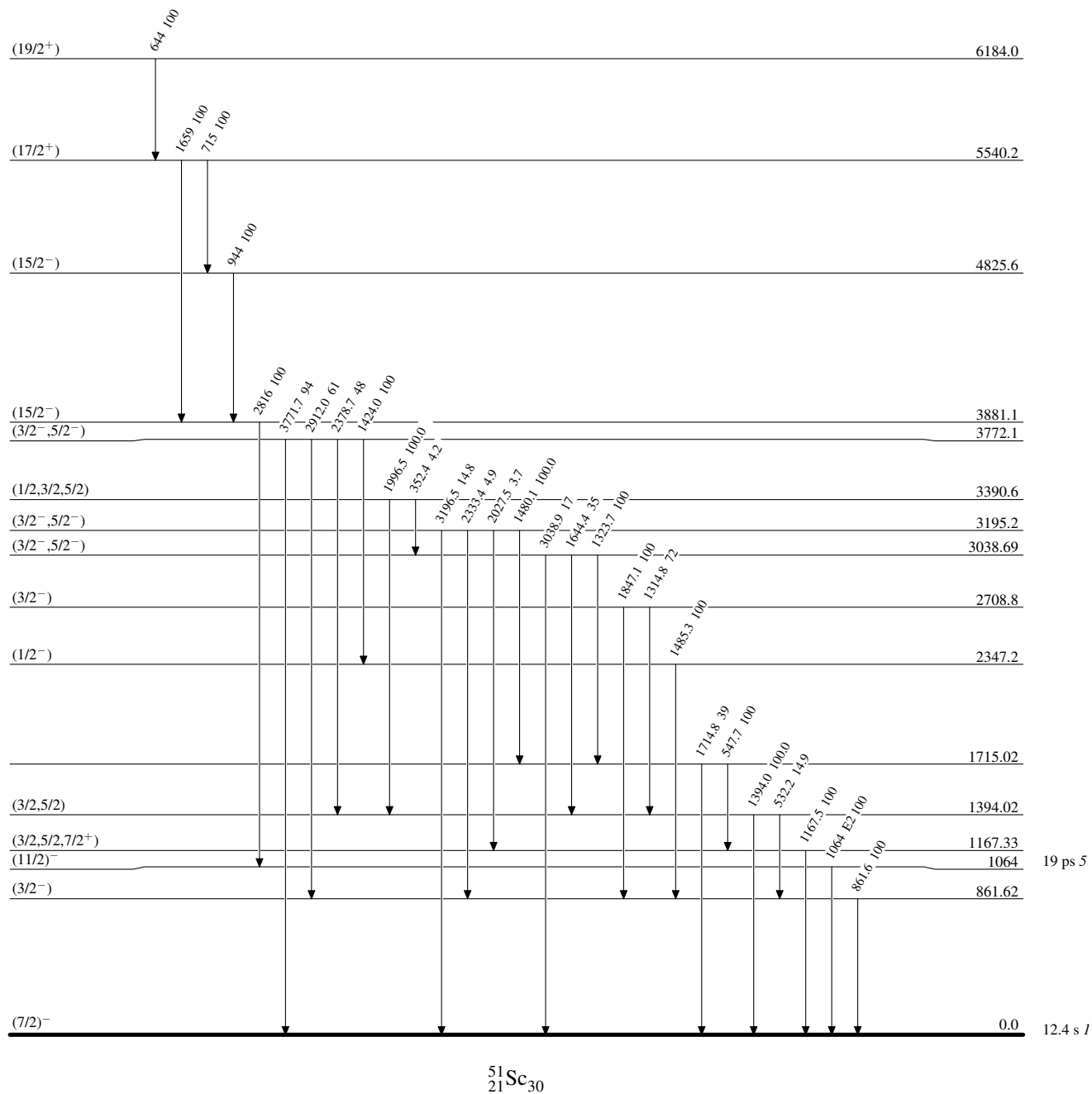
Adopted Levels, Gammas (continued)

$\gamma(^{51}\text{Sc})$								
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.	$\alpha^@$	Comments
861.62	(3/2 ⁻)	861.6 1	100	0.0	(7/2) ⁻			E_γ : Other: 860 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
1064	(11/2) ⁻	1064 3	100	0.0	(7/2) ⁻	E2	9.12×10 ⁻⁵	B(E2)(W.u.)=1.9 6 Mult.: From $\gamma(\theta)$ and $\gamma(\text{lin pol})$ in $^{208}\text{Pb}(^{48}\text{Ca}, X\gamma)$. E_γ, I_γ : from $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$. E_γ : Others: 1065 in $^{48}\text{Ca}(^{48}\text{Ca}, x\gamma)$, $^{208}\text{Pb}(^{48}\text{Ca}, X\gamma)$.
1167.33	(3/2, 5/2, 7/2 ⁺)	1167.5 3	100	0.0	(7/2) ⁻			E_γ : Other: 1166 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
1394.02	(3/2, 5/2)	532.2 4	14.9 12	861.62	(3/2) ⁻			E_γ : Other: 533 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
		1394.0 2	100.0 12	0.0	(7/2) ⁻			E_γ : Other: 1393 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
1715.02		547.7 1	100 3	1167.33	(3/2, 5/2, 7/2 ⁺)			E_γ : Other: 546 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
		1714.8 3	39 3	0.0	(7/2) ⁻			E_γ : Other: 1712 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
2347.2	(1/2) ⁻	1485.3 4	100	861.62	(3/2) ⁻			
2708.8	(3/2) ⁻	1314.8 6	72 10	1394.02	(3/2, 5/2)			
		1847.1 3	100 10	861.62	(3/2) ⁻			
3038.69	(3/2 ⁻ , 5/2 ⁻)	1323.7 2	100 5	1715.02				E_γ : Other: 1322 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
		1644.4 4	35 3	1394.02	(3/2, 5/2)			
		3038.9 7	17 3	0.0	(7/2) ⁻			
3195.2	(3/2 ⁻ , 5/2 ⁻)	1480.1 3	100.0 25	1715.02				E_γ : Other: 1481 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
		2027.5 27	3.7 12	1167.33	(3/2, 5/2, 7/2 ⁺)			
		2333.4 18	4.9 12	861.62	(3/2) ⁻			
		3196.5 11	14.8 25	0.0	(7/2) ⁻			
3390.6	(1/2, 3/2, 5/2)	352.4 23	4.2 10	3038.69	(3/2 ⁻ , 5/2 ⁻)			
		1996.5 5	100.0 10	1394.02	(3/2, 5/2)			
3772.1	(3/2 ⁻ , 5/2 ⁻)	1424.0 7	100 18	2347.2	(1/2) ⁻			
		2378.7 14	48 15	1394.02	(3/2, 5/2)			
		2912.0 10	61 18	861.62	(3/2) ⁻			
		3771.7 11	94 18	0.0	(7/2) ⁻			
3881.1	(15/2) ⁻	2816 [#]	100 [#]	1064	(11/2) ⁻			E_γ : Other: 2811 in $^{48}\text{Ca}(^{238}\text{U}, X\gamma)$.
4825.6	(15/2) ⁻	944 [#]	100 [#]	3881.1	(15/2) ⁻			
5540.2	(17/2 ⁺)	715 [#]	100 [#]	4825.6	(15/2) ⁻			
		1659 [#]	100 [#]	3881.1	(15/2) ⁻			
6184.0	(19/2 ⁺)	644 [#]	100 [#]	5540.2	(17/2 ⁺)			

[†] From $^{51}\text{Ca} \beta^-$ decay, except as noted.[‡] Relative photon branching from each level; values from $^{51}\text{Ca} \beta^-$ decay, except as noted.[#] From $(^{48}\text{Ca}, X\gamma)$, uncertainty unstated by authors.[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

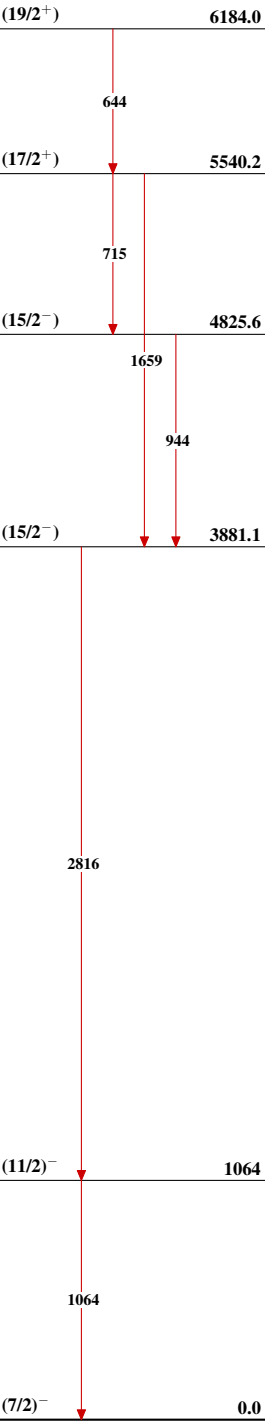
Adopted Levels, GammasLevel Scheme

Intensities: Relative photon branching from each level



Adopted Levels, Gammas

Seq.(A): Strongly populated γ -ray sequence



$^{51}_{21}\text{Sc}_{30}$