

¹⁸¹Ta(³⁰Si,X γ) 2008Ha39

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. J. Chiara and F. G. Kondev		NDS 111,141 (2010)	1-Oct-2009

E(³⁰Si)=152 MeV, beam intensity 2 pnA; 1 mg/cm² ¹⁸¹Ta target; Detectors: HERCULES evaporation residue detector in conjunction with GAMMASPHERE (98 HPGE detectors with Compton-suppression shields and absorbers of 0.05-mm tantalum and 0.25-mm copper at the front face); measured E γ , I γ , $\gamma\gamma$ coin, and $\gamma(\theta)$. The assignment of γ rays to ²⁰⁴At is based on coincidences of the main γ rays with the At K α x ray and systematics of known structures in neighboring nuclei.

²⁰⁴At Levels

E(level) [†]	J π [‡]	T _{1/2}	Comments
0	7 ⁺	9.12 min 11	J π ,T _{1/2} : From Adopted Levels.
587.30 20	10 ⁻	108 ms 10	E(level),J π ,T _{1/2} : From Adopted Levels.
587.30+x [#] 20			Additional information 1.
600.9 5	(8)		
718.7+x [#] 5			
1003.1+x [#] 7			
1091.6 7	(10)		
1301.7+x [#] 9			
1596.8+x [#] 10			
1680.1 9			
1808.8 9	(12)		
1842.7+x [#] 12			
2020.1+x [#] 13			
2216.3+x [#] ?			
2346.2 10	(14)		

[†] From a least-squares fit to E γ .

[‡] From 2008Ha39 deduced using γ -ray transition multiplicities, unless otherwise specified.

[#] Band(A): Possibly a shears band that involves one or more h_{9/2} and/or i_{13/2} protons coupled to i_{13/2} neutron(s).

γ (²⁰⁴At)

E γ [†]	I γ [‡]	E _i (level)	J _i π	E _f	J _f π	Mult. [#]	Comments
131.4 5	34 3	718.7+x		587.30+x			
177.4 5	21 2	2020.1+x		1842.7+x			
196.2@ 5	<5	2216.3+x?		2020.1+x			
245.9 5	64 4	1842.7+x		1596.8+x		D	Mult.: A ₂ =-0.23 8.
284.4 5	100	1003.1+x		718.7+x		D	Mult.: A ₂ =-0.38 8.
295.1 5	84 5	1596.8+x		1301.7+x		D	Mult.: A ₂ =-0.44 5. The authors stated that E γ was part of an unresolved doublet.
298.6 5	87 5	1301.7+x		1003.1+x		D	Mult.: A ₂ =-0.11 9.
^x 442.6 5							
490.7 5	69 4	1091.6	(10)	600.9	(8)	E2	Mult.: A ₂ =+0.20 4.
^x 496.7 5							
537.4 5	24 2	2346.2	(14)	1808.8	(12)		
587.3 2	100	587.30	10 ⁻	0	7 ⁺	E3	E γ ,I γ ,Mult.: From adopted gammas.
588.5 5	11 2	1680.1		1091.6	(10)		
600.9 5	100	600.9	(8)	0	7 ⁺	D	Mult.: A ₂ =-0.04 4. The authors stated that E γ was part of an unresolved doublet.
717.2 5	69 4	1808.8	(12)	1091.6	(10)	E2	Mult.: A ₂ =+0.36 6.

Continued on next page (footnotes at end of table)

$^{181}\text{Ta}(^{30}\text{Si},\text{X}\gamma)$ **2008Ha39** (continued)

$\gamma(^{204}\text{At})$ (continued)

† From **2008Ha39**, unless otherwise specified. The uncertainties were estimated by the evaluators.

‡ The intensities for transitions within the shears band are normalized to $I\gamma(284.4\gamma)=100$, while those for other γ rays are normalized to $I\gamma(600.9\gamma)=100$.

From $\gamma(\theta)$ in **2008Ha39**, unless otherwise specified.

@ Placement of transition in the level scheme is uncertain.

x γ ray not placed in level scheme.

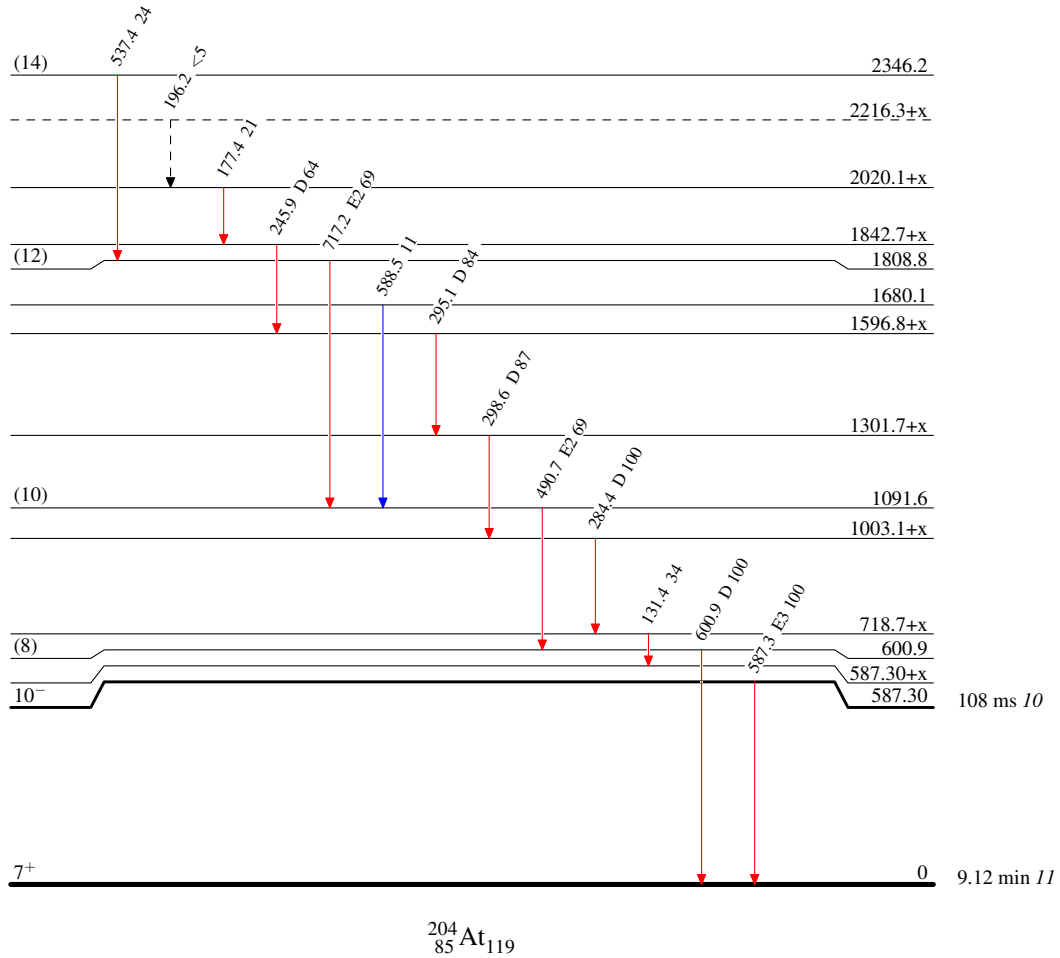
$^{181}\text{Ta}(^{30}\text{Si}, X\gamma)$ 2008Ha39

Legend

Level Scheme

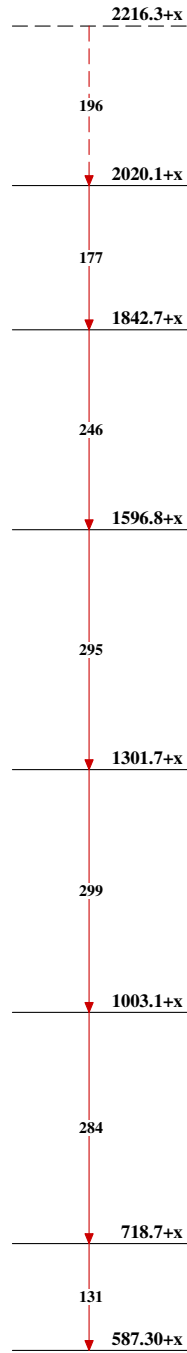
Intensities: Type not specified

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - - γ Decay (Uncertain)



$^{181}\text{Ta}(^{30}\text{Si},\text{X}\gamma)$ 2008Ha39

Band(A): Possibly a shears band that involves one or more $h_{9/2}$ and/or $i_{13/2}$ protons coupled to $i_{13/2}$ neutron(s)

 $^{204}_{85}\text{At}_{119}$