

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni		NDS 111,1 (2010)	1-May-2009

$Q(\beta^-) = -362.5$; $S(n) = 8408.6$; $S(p) = 5612.5$; $Q(\alpha) = -3569.5$ [2012Wa38](#)
 Note: Current evaluation has used the following Q record.
 $Q(\beta^-) = -361.5$; $S(n) = 8408.6$; $S(p) = 5612.4$; $Q(\alpha) = -3569.4$ [2009AuZZ](#)

 ^{72}As LevelsCross Reference (XREF) Flags

A	^{72}Se ε decay	F	$^{59}\text{Co}(^{16}\text{O}, n2p\gamma)$
B	$^{72}\text{Ge}(p, n\gamma)$: set 1	G	$^{69}\text{Ga}(\alpha, n\gamma)$
C	$^{72}\text{Ge}(p, n\gamma)$: set 2	H	$^{62}\text{Ni}(^{13}\text{C}, p2n\gamma)$
D	$^{59}\text{Co}(^{19}\text{F}, \alpha p n\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$	I	$^{47}\text{Ti}(^{28}\text{Si}, 3p\gamma)$
E	$^{70}\text{Ge}(\alpha, np\gamma)$, $^{72}\text{Ge}(\alpha, 3np\gamma)$		

E(level) [‡]	J ^π	T _{1/2}	XREF	Comments
0	2 ⁻	26.0 h 1	ABCDEFGHI	$\% \varepsilon + \% \beta^+ = 100$ $Q = -0.08224$; $\mu = -2.15663$ μ, Q : atomic beam (1989Ra17 , 2005St24); recalculated for consistency with the ^{75}As standard. J^π : β^+ first-forbidden unique shape: ^{72}As ε decay to 0 ⁺ , ^{72}Ge g.s. $T_{1/2}$: from 1972Em01 . Others: 26 h (1947Mil11 , 1948Mc31), 26.7 h (1950Ho26), 24 h (1965He08).
46.025 18	1 ⁺	10.7 ns 3	ABCDEFGHI	J^π : $\log ft = 4.495$ from 0 ⁺ , ^{72}Se . $T_{1/2}$: from 1965Hu02 , ^{72}Se ε decay.
213.563 22	3 ⁺	85 ns 5	BCDEFGHI	$\mu = +1.582$ $T_{1/2}$: from $^{72}\text{Ge}(p, n\gamma)$: set 1; other: 78.4 ns ($^{28}\text{Si}, 3p\gamma$). J^π : E1 γ to g.s. 2 ⁻ , E2 γ to 1 ⁺ , $\gamma(\theta)$. μ : TDPAD (1975Be32).
288.473 22	(2) ⁺	2 ns 1	BC	$T_{1/2}$: from (p, n γ) set 1. J^π : E1 γ to g.s. 2 ⁻ , $\sigma(E)$.
309.741 23	4 ⁻	27 ns 5	BCDEFGHI	$T_{1/2}$: weighted average of 33 ns 2 ($^{72}\text{Ge}(p, n\gamma)$: set 1), 17 ns 3 ($^{70}\text{Ge}(\alpha, np\gamma)$, $^{72}\text{Ge}(\alpha, 3np\gamma)$), and 20 ns 6 ($^{47}\text{Ti}(^{28}\text{Si}, 3p\gamma)$). J^π : E1 γ to 3 ⁺ , E2 γ to g.s. 2 ⁻ , $\gamma(\theta)$.
318.19 4	4 ⁺	27 ns 1	BC E G	$T_{1/2}$: from $^{72}\text{Ge}(p, n\gamma)$: set 1. J^π : M1 γ from 3 ⁺ , $\sigma(E)$. This choice will have $M\gamma = [M2]$ for the 318 γ , with a $B(M2)(\text{W.u.}) = 1.7019$, which is marginally higher than the recommended upper limit of 1.
362.82 4	5 ⁻		BCDEFGHI	J^π : M1 γ from 4 ⁻ , $\sigma(E)$.
380.13 4	0 ⁺		BC	J^π : M1 γ to 1 ⁺ , $\sigma(E)$.
390.14 3	1 ⁺ , 2 ⁺		BC	J^π : M1 γ to 1 ⁺ , $\sigma(E)$.
414.40 3	3 ⁻		BC EFG	J^π : M1 γ to g.s. 2 ⁻ , $\sigma(E)$.
438.74 3	1 ⁺ , 2 ⁺		BC	J^π : E1 γ to g.s. 2 ⁻ , $\sigma(E)$.
439.88 3	3 ⁺		BC	J^π : M1 γ to 3 ⁺ , $\sigma(E)$.
482.63 3	2 ⁺		BC	J^π : M1 γ to 1 ⁺ , $\sigma(E)$.
501.38 3	2 ⁺		BC	J^π : M1 γ to 1 ⁺ , $\sigma(E)$.
514.19 4	(0) ⁺		BC	J^π : M1 γ to 1 ⁺ , $\sigma(E)$.
525.33 3	3 ⁻		BC G	J^π : M1 γ to 2 ⁻ , $\sigma(E)$.
559.00 3	4 ⁻		BC G	J^π : E2 γ to g.s. 2 ⁻ , $\sigma(E)$.
562.85 8	7 ⁻	87.9 ns 17	DEFGHI	$g = -0.1162$ $T_{1/2}$: weighted average of 87 ns 2 ($^{59}\text{Co}(^{16}\text{O}, n2p\gamma)$) and 90 ns 3

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Adopted Levels, Gammas (continued) ^{72}As Levels (continued)

E(level) [‡]	J ^π	T _{1/2}	XREF	Comments
				($^{47}\text{Ti}(^{28}\text{Si},3p\gamma)$).
				J ^π : E2 γ to 5 ⁻ .
				γ: TDPAD (1977Ra03).
565.16 4	1 ⁻ ,2 ⁻		BC	J ^π : M1 γ to g.s. 2 ⁻ , σ(E).
565.71 3	1 ⁺ ,2 ⁺		BC	J ^π : M1 γ to 1 ⁺ , σ(E).
586.42 4	1 ⁺ ,2 ⁺		BC	J ^π : E1 γ to g.s. 2 ⁻ , M1 γ to 1 ⁺ .
593.55 4	4 ⁻		BC G	J ^π : M1 γ to 4 ⁻ , σ(E).
624.66 3	1 ⁺ ,2 ⁺		BC	J ^π : M1 γ to 1 ⁺ , γ to g.s. 2 ⁻ .
644.84 4	2 ⁺		BC	J ^π : M1 γ to 1 ⁺ , σ(E).
650.16 3	3 ⁺		BC	J ^π : M1 γ to 4 ⁺ , σ(E).
662.86 8	6 ⁻		BCDEFGHI	J ^π : M1+E2 γ to 5 ⁻ , M2 γ from 8 ⁺ .
673.63 3	2 ⁺		BC	J ^π : M1 γ to 1 ⁺ , σ(E).
708.07 16	(5) ⁻		BC G	J ^π : M1 γ to 5 ⁻ , γ from 6 ⁺ .
715.32 5	3 ⁺		C	J ^π : M1 γ to 4 ⁺ , γ to g.s. 2 ⁻ .
729.52 4	3 ⁻		BC	J ^π : M1 γ to g.s. 2 ⁻ , σ(E).
732.50 5	(0 to 4) ⁻		BC	J ^π : E2 γ to g.s. 2 ⁻ ,
742.71 16	4 to 7		BC	
744.99 6	4 ⁻ ,5 ⁻ ,6 ⁻		C G	J ^π : M1 γ to 5 ⁻ .
746.96 3	2 ⁺ ,3 ⁺		BC	J ^π : M1 γ to 3 ⁺ , γ to 1 ⁺ .
794.26 5	(3,4)		BC E	
800.27 3	1,2		BC	
801.94 7	(4) ⁺		BC G	J ^π : E1 γ's to 3 ⁻ and 4 ⁻ .
806.40 4	1,3		C	
813.32 10	4 to 6		BC	
816.77 4	1,2		C	
828.25@ 9	6 ⁺		B DE GHI	J ^π : E1 γ's to 5 ⁻ and 7 ⁻ .
834.20# 12	6 ⁻		B D GHI	J ^π : M1 γ's to 5 ⁻ and 7 ⁻ .
837.66 5	(1,2)		BC	
839.91 7	4 ⁻ ,5 ⁻		BC G	E(level): The gamma rays depopulating this level are taken from $^{72}\text{Ge}(p,n\gamma)$:set 2 and $^{69}\text{Ga}(\alpha,n\gamma)$. The 530 keV γ was also observed by $^{72}\text{Ge}(p,n\gamma)$:set 1.
				J ^π : M1 γ to 4 ⁻ .
841.46 4	(2,3)		BC	E(level): The gamma rays depopulating this level are taken from $^{72}\text{Ge}(p,n\gamma)$:set 2. The 401 keV and 427 γ's were also observed by $^{72}\text{Ge}(p,n\gamma)$:set 1.
843.79 3	1,2		C	
866.91 10	4 ⁻		B G	J ^π : M1 γ's to 3 ⁻ and 5 ⁻ .
981.13@ 12	8 ⁺	402 ps 14	B DE GHI	T _{1/2} : from $^{47}\text{Ti}(^{28}\text{Si},3p\gamma)$.
				J ^π : E2 γ to 6 ⁺ , band member.
1033.55 13	(5) ⁺		B G	J ^π : M1 γ's to 6 ⁺ and (4) ⁺ .
1179.05 13	(7) ⁺		B D GHI	J ^π : M1 γ to 6 ⁺ , γ to 8 ⁺ .
1191.1 7	4 ⁺ ,5 ⁺		G	J ^π : M1+E2 γ to (4) ⁺ , γ to 6 ⁺ .
1346.33# 17	(7) ⁻		D GH	J ^π : M1 γ to 7 ⁻ , band member.
1401.82@ 21	9 ⁺		D GHI	J ^π : M1 γ to 8 ⁺ , band member.
1665.64# 18	(8) ⁻		D H	J ^π : M1 γ to (7) ⁻ , band member.
1875.05@ 21	10 ⁺	0.9 ps 3	D HI	T _{1/2} : weighted average of 0.76 ps 14 ($^{59}\text{Co}(^{19}\text{F},\alpha p n\gamma)$) and 1.7 ps 4 ($^{65}\text{Cu}(^{12}\text{Cf},\alpha n\gamma)$).
				J ^π : E2 γ to 8 ⁺ , band member.
2133.79# 22	(9) ⁻		D H	J ^π : E2 γ to (7) ⁻ , band member.
2307.60@ 23	11 ⁺	0.27 [†] ps 16	D HI	J ^π : E2 γ to 9 ⁺ , band member.
2326.4 4	(10) ⁻		D HI	J ^π : (E1) γ to 9 ⁺ .
2516.92# 24	(10) ⁻		D H	J ^π : E2 γ to (8) ⁻ , band member.
2925.0 4	(11) ⁻		D H	

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Adopted Levels, Gammas (continued) ^{72}As Levels (continued)

E(level) [‡]	J ^π	T _{1/2}	XREF		Comments
3043.9 [#] 3	(11 ⁻)		D	H	J ^π : (M1+E2) γ to (9) ⁻ , band member.
3151.2 [@] 3	12 ⁺	0.22 [†] ps 7	D	H	J ^π : E2 γ to 10 ⁺ , band member.
3445.7 [#] 4	(12 ⁻)		D	H	J ^π : E2 γ to (10) ⁻ , band member.
3504.8 [@] 3	13 ⁺	0.17 [†] ps 5	D	HI	J ^π : E2 γ to 11 ⁺ , band member.
4777.8 [@] 8	(15) ⁺	0.22 [†] ps 7	D	HI	J ^π : E2 γ to 13 ⁺ , possible band member.
6088.0 [@] 9	(17 ⁺)	0.29 [†] ps 10	D	HI	J ^π : γ to (15) ⁺ , possible band member.

[†] From $^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$.

[‡] From least-squares fit to $E\gamma$ assuming $\Delta E\gamma=1$ keV when unknown.

[#] Band(A): Based on 834 keV 6-.

[@] Band(B): Based on 828 keV 6+.

Adopted Levels, Gammas (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	$\gamma(^{72}\text{As})$ Comments
46.025	1 ⁺	45.89 4	100	0	2 ⁻	E1	0.747	$\alpha(\text{K})=0.664$ 10; $\alpha(\text{L})=0.0715$ 11; $\alpha(\text{M})=0.01074$ 16; $\alpha(\text{N})=0.000768$ 11; $\alpha(\text{N}+..)=0.000768$ 11 B(E1)(W.u.)=0.000216 7 E_γ : weighted average of 46.0 3 (^{72}Se ε decay), 45.8 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 45.90 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 45.9 2 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 46.0 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$). Mult.: from ε decay.
213.563	3 ⁺	166.77 5	100.0 13	46.025	1 ⁺	E2	0.1168	$\alpha(\text{K})=0.1027$ 15; $\alpha(\text{L})=0.01210$ 17; $\alpha(\text{M})=0.00183$ 3; $\alpha(\text{N})=0.0001303$ 19 $\alpha(\text{N}+..)=0.0001303$ 19 B(E2)(W.u.)=1.50 10 E_γ : weighted average of 167.9 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 167.80 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 167.6 1 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 167.8 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$), 167.6 1 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$). I_γ : weighted average of 100.0 21 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 100 7 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 100.0 17 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$).
		213.68 4	80.8 13	0	2 ⁻	E1	0.00776	$\alpha(\text{K})=0.00693$ 10; $\alpha(\text{L})=0.000718$ 10; $\alpha(\text{M})=0.0001091$ 16; $\alpha(\text{N})=8.21\times 10^{-6}$ 12 $\alpha(\text{N}+..)=8.21\times 10^{-6}$ 12 B(E1)(W.u.)= 1.97×10^{-7} 13 E_γ : weighted average of 213.7 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 213.72 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 213.6 1 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 213.7 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$), 213.6 1 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$). I_γ : weighted average of 82.5 21 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 81 6 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 79.7 17 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$).
288.473	(2) ⁺	74.77 5	10 3	213.563	3 ⁺			E_γ : weighted average of 74.7 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 74.79 6 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : weighted average of 17 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 9.0 15 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2).
		242.53 3	100 6	46.025	1 ⁺	M1+E2	0.019 11	$\alpha(\text{K})=0.017$ 10; $\alpha(\text{L})=0.0019$ 11; $\alpha(\text{M})=0.00029$ 16; $\alpha(\text{N})=2.1\times 10^{-5}$ 12; $\alpha(\text{N}+..)=2.1\times 10^{-5}$ 12 E_γ : weighted average of 242.6 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 242.52 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : weighted average of 1.0×10^2 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 100 6 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2).
		288.42 5	13.4 19	0	2 ⁻	E1	0.00329	$\alpha(\text{K})=0.00294$ 5; $\alpha(\text{L})=0.000304$ 5; $\alpha(\text{M})=4.62\times 10^{-5}$ 7; $\alpha(\text{N})=3.49\times 10^{-6}$ 5; $\alpha(\text{N}+..)=3.49\times 10^{-6}$ 5 B(E1)(W.u.)=9.E-7 5 E_γ : weighted average of 288.4 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 288.43 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : weighted average of 17.5 17 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 12.5 8 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2).
309.741	4 ⁻	96.09 5	40 5	213.563	3 ⁺	E1	0.0835	$\alpha(\text{K})=0.0744$ 11; $\alpha(\text{L})=0.00779$ 11; $\alpha(\text{M})=0.001178$ 17; $\alpha(\text{N})=8.70\times 10^{-5}$ 13; $\alpha(\text{N}+..)=8.70\times 10^{-5}$ 13 B(E1)(W.u.)= 4.5×10^{-6} 11 E_γ : weighted average of 96.1 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 96.10 15 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 96.1 1 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 96.0 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$), 96.1 1 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$).

Adopted Levels, Gammas (continued)

 $\gamma(^{72}\text{As})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
309.741	4 ⁻	309.77 3	100 7	0	2 ⁻	E2	0.01238	I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2. Mult.: from $^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$. $\alpha(\text{K})_{\text{exp}}=0.0113$ 10 $\alpha(\text{K})=0.01098$ 16; $\alpha(\text{L})=0.001204$ 17; $\alpha(\text{M})=0.000183$ 3; $\alpha(\text{N})=1.349\times 10^{-5}$ 19 $\alpha(\text{N}+..)=1.349\times 10^{-5}$ 19 $\text{B}(\text{E}2)(\text{W.u.})=0.29$ 6 E_γ : weighted average of 309.9 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 309.78 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 309.7 1 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 309.7 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$), 309.7 1 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2. $\alpha(\text{K})=0.0707$ 11; $\alpha(\text{L})=0.00766$ 11; $\alpha(\text{M})=0.001170$ 17; $\alpha(\text{N})=8.82\times 10^{-5}$ 13; $\alpha(\text{N}+..)=8.82\times 10^{-5}$ 13 $\text{B}(\text{M}1)(\text{W.u.})=0.00060$ 3 Mult.: from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1. E_γ : weighted average of 104.6 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 104.52 6 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 105.2 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$). I_γ : weighted average of 100.0 15 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 100 12 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). $\alpha(\text{K})=0.01705$ 25; $\alpha(\text{L})=0.00190$ 3; $\alpha(\text{M})=0.000291$ 5; $\alpha(\text{N})=2.19\times 10^{-5}$ 4; $\alpha(\text{N}+..)=2.19\times 10^{-5}$ 4 $\text{B}(\text{M}2)(\text{W.u.})=1.70$ 19 E_γ : weighted average of 318.6 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 318.25 7 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 319.4 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$). I_γ : weighted average of 7.0 20 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 10.2 7 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). Other: 91 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$). E_γ : weighted average of 53.1 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 53.04 7 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 53.1 2 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 53.0 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$). Mult.: from $^{70}\text{Ge}(\alpha,\text{npy})$. $\alpha(\text{K})=0.00358$ 5; $\alpha(\text{L})=0.000376$ 6; $\alpha(\text{M})=5.74\times 10^{-5}$ 8; $\alpha(\text{N})=4.37\times 10^{-6}$ 7; $\alpha(\text{N}+..)=4.37\times 10^{-6}$ 7 E_γ : weighted average of 334.1 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 334.08 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). $\alpha(\text{K})=0.00333$ 5; $\alpha(\text{L})=0.000350$ 5; $\alpha(\text{M})=5.34\times 10^{-5}$ 8; $\alpha(\text{N})=4.06\times 10^{-6}$ 6; $\alpha(\text{N}+..)=4.06\times 10^{-6}$ 6 E_γ : weighted average of 344.1 2 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 344.17 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). $\alpha(\text{K})_{\text{exp}}=0.00232$ 24 $\alpha(\text{K})=0.00214$ 3; $\alpha(\text{L})=0.000224$ 4; $\alpha(\text{M})=3.42\times 10^{-5}$ 5; $\alpha(\text{N})=2.60\times 10^{-6}$ 4; $\alpha(\text{N}+..)=2.60\times 10^{-6}$ 4 E_γ : weighted average of 414.6 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 414.48 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 414.1 2 ($^{70}\text{Ge}(\alpha,\text{npy})$, $^{72}\text{Ge}(\alpha,3\text{npy})$). Mult.: from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2 and $69\alpha(\alpha,\text{n}\gamma)$. Other: M=E1 $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1. $\alpha(\text{K})=0.0268$ 4; $\alpha(\text{L})=0.00288$ 4; $\alpha(\text{M})=0.000439$ 7; $\alpha(\text{N})=3.32\times 10^{-5}$ 5;
318.19	4 ⁺	104.58 11	100.0 15	213.563	3 ⁺	(M1)	0.0796	
		318.39 25	9.9 10	0	2 ⁻	[M2]	0.0193	
362.82	5 ⁻	53.06 5	100	309.741	4 ⁻	D		
380.13	0 ⁺	334.08 4	100	46.025	1 ⁺	M1 ⁺	0.00402	
390.14	1 ⁺ ,2 ⁺	344.17 3	100	46.025	1 ⁺	M1	0.00374	
414.40	3 ⁻	414.48 6	100	0	2 ⁻	M1	0.00241	
438.74	1 ⁺ ,2 ⁺	150.31 10	6.6 6	288.473	(2) ⁺	M1	0.0302	

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
438.74	$1^+, 2^+$	392.74 6	48 3	46.025	1^+	$M1(+E2)^\dagger$	0.0041 14	$\alpha(N+..)=3.32\times 10^{-5}$ 5 $E_\gamma, I_\gamma, \text{Mult.}$: Observed only in $^{72}\text{Ge}(p, n\gamma)$:set 2. $\alpha(K)=0.0037$ 13; $\alpha(L)=0.00039$ 14; $\alpha(M)=6.0\times 10^{-5}$ 21; $\alpha(N)=4.5\times 10^{-6}$ 16; $\alpha(N+..)=4.5\times 10^{-6}$ 16 E_γ : weighted average of 392.9 1 ($^{72}\text{Ge}(p, n\gamma)$:set 1), 392.72 4 ($^{72}\text{Ge}(p, n\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(p, n\gamma)$:set 2; other: 43 16 ($^{72}\text{Ge}(p, n\gamma)$:set 1). $\alpha(K)=0.000950$ 14; $\alpha(L)=9.80\times 10^{-5}$ 14; $\alpha(M)=1.492\times 10^{-5}$ 21; $\alpha(N)=1.132\times 10^{-6}$ 16 $\alpha(N+..)=1.132\times 10^{-6}$ 16 E_γ : weighted average of 438.7 1 ($^{72}\text{Ge}(p, n\gamma)$:set 1), 438.65 5 ($^{72}\text{Ge}(p, n\gamma)$:set 2).
		438.66 4	100 6	0	2^-	$E1^\dagger$	1.06×10^{-3}	
439.88	3^+	121.72 12	4.5 10	318.19	4^+	$M1^\dagger$	0.0529	$\alpha(K)=0.0470$ 7; $\alpha(L)=0.00507$ 8; $\alpha(M)=0.000774$ 11; $\alpha(N)=5.84\times 10^{-5}$ 9; $\alpha(N+..)=5.84\times 10^{-5}$ 9 E_γ : weighted average of 121.6 1 ($^{72}\text{Ge}(p, n\gamma)$:set 1), 121.84 10 ($^{72}\text{Ge}(p, n\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(p, n\gamma)$:set 2; other: 30 10 $^{72}\text{Ge}(p, n\gamma)$:set 1. $\alpha(K)=0.00937$ 14; $\alpha(L)=0.000993$ 14; $\alpha(M)=0.0001516$ 22; $\alpha(N)=1.150\times 10^{-5}$ 17 $\alpha(N+..)=1.150\times 10^{-5}$ 17 E_γ : weighted average of 226.3 1 ($^{72}\text{Ge}(p, n\gamma)$:set 1), 226.21 4 ($^{72}\text{Ge}(p, n\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(p, n\gamma)$:set 2; other: 100 10 $^{72}\text{Ge}(p, n\gamma)$:set 1. E_γ, I_γ : Observed only in $^{72}\text{Ge}(p, n\gamma)$:set 2.
		226.22 4	100 6	213.563	3^+	$M1^\dagger$	0.01053	$\alpha(K)=0.00190$ 3; $\alpha(L)=0.000198$ 3; $\alpha(M)=3.02\times 10^{-5}$ 5; $\alpha(N)=2.30\times 10^{-6}$ 4; $\alpha(N+..)=2.30\times 10^{-6}$ 4 E_γ : weighted average of 436.7 1 ($^{72}\text{Ge}(p, n\gamma)$:set 1), 436.59 4 ($^{72}\text{Ge}(p, n\gamma)$:set 2). E_γ, I_γ : Observed only in $^{72}\text{Ge}(p, n\gamma)$:set 2. $\alpha(K)=0.026$ 16; $\alpha(L)=0.0030$ 18; $\alpha(M)=0.0004$ 3; $\alpha(N)=3.3\times 10^{-5}$ 20; $\alpha(N+..)=3.3\times 10^{-5}$ 20 E_γ : weighted average of 213.0 2 ($^{72}\text{Ge}(p, n\gamma)$:set 1), 212.85 19 ($^{72}\text{Ge}(p, n\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(p, n\gamma)$:set 2; other: 40 20 ($^{72}\text{Ge}(p, n\gamma)$:set 1). $\alpha(K)=0.001723$ 25; $\alpha(L)=0.000179$ 3; $\alpha(M)=2.74\times 10^{-5}$ 4; $\alpha(N)=2.09\times 10^{-6}$ 3; $\alpha(N+..)=2.09\times 10^{-6}$ 3 E_γ : from $^{72}\text{Ge}(p, n\gamma)$:set 2; other: 455.5 1 ($^{72}\text{Ge}(p, n\gamma)$:set 1). I_γ : from $^{72}\text{Ge}(p, n\gamma)$:set 2; other: 94 10 ($^{72}\text{Ge}(p, n\gamma)$:set 1). $\alpha(K)=0.000678$ 10; $\alpha(L)=6.99\times 10^{-5}$ 10; $\alpha(M)=1.065\times 10^{-5}$ 15;
482.63	2^+	440.10 12	3.1 6	0	2^-	$M1^\dagger$	0.00213	
		436.61 4	100	46.025	1^+			
501.38	2^+	62.63 6	2.0 3	438.74	$1^+, 2^+$	$M1(+E2)^\dagger$	0.030 18	
		212.92 14	60 4	288.473	$(2)^+$			
		455.35 4	100 6	46.025	1^+	$M1^\dagger$	0.00193	
		501.40 9	24.0 15	0	2^-	$(E1)^\dagger$	7.60×10^{-4}	

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)

<u>E_i(level)</u>	<u>J_i^{π}</u>	<u>E_{γ}</u>	<u>I_{γ}</u>	<u>E_f</u>	<u>J_f^{π}</u>	<u>Mult.</u>	<u>α^b</u>	<u>Comments</u>
								$\alpha(\text{N})=8.09\times 10^{-7}$ 12 $\alpha(\text{N}+..)=8.09\times 10^{-7}$ 12 E _{γ} : weighted average of 501.4 1 (⁷² Ge(p,n γ):set 1), 501.43 25 (⁷² Ge(p,n γ):set 2). I _{γ} : from ⁷² Ge(p,n γ):set 2, other: 100 12 (⁷² Ge(p,n γ):set 1). E _{γ} ,I _{γ} : Observed only in ⁷² Ge(p,n γ):set 2.
514.19	(0) ⁺	123.96 20 468.19 6	1.51 20 100 6	390.14 46.025	1 ⁺ ,2 ⁺ 1 ⁺	M1 [†]	0.00181	$\alpha(\text{K})=0.001615$ 23; $\alpha(\text{L})=0.0001682$ 24; $\alpha(\text{M})=2.57\times 10^{-5}$ 4; $\alpha(\text{N})=1.96\times 10^{-6}$ 3; $\alpha(\text{N}+..)=1.96\times 10^{-6}$ 3 E _{γ} : weighted average of 468.3 1 (⁷² Ge(p,n γ):set 1), 468.16 5 (⁷² Ge(p,n γ):set 2).
525.33	3 ⁻	215.58 6	61 3	309.741	4 ⁻	M1 [†]	0.01189	$\alpha(\text{K})=0.01058$ 15; $\alpha(\text{L})=0.001123$ 16; $\alpha(\text{M})=0.0001714$ 24; $\alpha(\text{N})=1.301\times 10^{-5}$ 19 $\alpha(\text{N}+..)=1.301\times 10^{-5}$ 19 E _{γ} : weighted average of 215.5 2 (⁷² Ge(p,n γ):set 1), 215.59 6 (⁷² Ge(p,n γ):set 2). I _{γ} : weighted average of 70 10 (⁷² Ge(p,n γ):set 1), 60 3 (⁷² Ge(p,n γ):set 2).
		525.33 4	100 5	0	2 ⁻	M1 [†]	1.39 $\times 10^{-3}$	$\alpha(\text{K})=0.001241$ 18; $\alpha(\text{L})=0.0001288$ 18; $\alpha(\text{M})=1.97\times 10^{-5}$ 3; $\alpha(\text{N})=1.500\times 10^{-6}$ 21 $\alpha(\text{N}+..)=1.500\times 10^{-6}$ 21 E _{γ} : weighted average of 525.4 1 (⁷² Ge(p,n γ):set 1), 525.32 4 (⁷² Ge(p,n γ):set 2). I _{γ} : weighted average of 100 10 (⁷² Ge(p,n γ):set 1), 100 6 (⁷² Ge(p,n γ):set 2).
559.00	4 ⁻	144.58 5	52 4	414.40	3 ⁻	M1 [†]	0.0335	$\alpha(\text{K})=0.0297$ 5; $\alpha(\text{L})=0.00319$ 5; $\alpha(\text{M})=0.000487$ 7; $\alpha(\text{N})=3.68\times 10^{-5}$ 6; $\alpha(\text{N}+..)=3.68\times 10^{-5}$ 6 E _{γ} : weighted average of 144.7 1 (⁷² Ge(p,n γ):set 1), 144.58 5 (⁷² Ge(p,n γ):set 2). I _{γ} : weighted average of 63.5 24 (⁷² Ge(p,n γ):set 1), 52 4 (⁷² Ge(p,n γ):set 2).
		196.18 10	15.7 9	362.82	5 ⁻	M1(+E2) [†]	0.040 25	$\alpha(\text{K})=0.035$ 22; $\alpha(\text{L})=0.004$ 3; $\alpha(\text{M})=0.0006$ 4; $\alpha(\text{N})=4.\text{E}-5$ 3; $\alpha(\text{N}+..)=4.\text{E}-5$ 3 E _{γ} ,I _{γ} : from ⁷² Ge(p,n γ):set 2, not observed by ⁷² Ge(p,n γ):set 1.
		558.99 4	100 6	0	2 ⁻	E2 [†]	0.00182	$\alpha(\text{K})=0.001618$ 23; $\alpha(\text{L})=0.0001713$ 24; $\alpha(\text{M})=2.61\times 10^{-5}$ 4; $\alpha(\text{N})=1.96\times 10^{-6}$ 3; $\alpha(\text{N}+..)=1.96\times 10^{-6}$ 3 E _{γ} : from ⁷² Ge(p,n γ):set 2; other: 559.1 1 (⁷² Ge(p,n γ):set 1).
562.85	7 ⁻	200.02 9	100	362.82	5 ⁻	E2	0.0596	$\alpha(\text{K})=0.0526$ 8; $\alpha(\text{L})=0.00603$ 9; $\alpha(\text{M})=0.000914$ 13; $\alpha(\text{N})=6.58\times 10^{-5}$ 10; $\alpha(\text{N}+..)=6.58\times 10^{-5}$ 10 B(E2)(W.u.)=1.067 21

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
Mult.: from ⁵⁹ Co(¹⁶ O,n2p γ). E γ : weighted average of 200.0 1 (⁵⁹ Co(¹⁹ F, α p γ), ⁶⁵ Cu(¹² C, α n γ)), 200.1 2 (⁷⁰ Ge(α ,n γ), ⁷² Ge(α ,3n γ)).								
565.16	1 ⁻ ,2 ⁻	151.01 [‡] 10 565.12 4	1.55 [‡] 17 100 6	414.40 0	3 ⁻ 2 ⁻	M1 [†]	1.18×10 ⁻³	$\alpha(\text{N})=1.271\times 10^{-6}$ 18 E γ : from ⁷² Ge(p,n γ):set 2; other: 565.2 1 (⁷² Ge(p,n γ):set 1). I γ : from ⁷² Ge(p,n γ):set 2.
565.71	1 ⁺ ,2 ⁺	126.80 [‡] 10 175.59 [‡] 9 519.70 4	1.36 [‡] 13 1.90 [‡] 17 100 6	438.74 390.14 46.025	1 ⁺ ,2 ⁺ 1 ⁺ ,2 ⁺ 1 ⁺	M1+E2 [†] M1 [†]	0.19 14 1.43×10 ⁻³	$\alpha(\text{K})=0.16$ 12; $\alpha(\text{L})=0.020$ 16; $\alpha(\text{M})=0.0030$ 24; $\alpha(\text{N})=0.00021$ 16; $\alpha(\text{N}+..)=0.00021$ 16 $\alpha(\text{K})=0.001272$ 18; $\alpha(\text{L})=0.0001321$ 19; $\alpha(\text{M})=2.02\times 10^{-5}$ 3; $\alpha(\text{N})=1.538\times 10^{-6}$ 22 $\alpha(\text{N}+..)=1.538\times 10^{-6}$ 22 E γ : from ⁷² Ge(p,n γ):set 2; other: 519.7 1 (⁷² Ge(p,n γ):set 1). $\alpha(\text{K})=0.001163$ 17; $\alpha(\text{L})=0.0001207$ 17; $\alpha(\text{M})=1.84\times 10^{-5}$ 3; $\alpha(\text{N})=1.406\times 10^{-6}$ 20 $\alpha(\text{N}+..)=1.406\times 10^{-6}$ 20 E γ : weighted average of 540.6 1 (⁷² Ge(p,n γ):set 1), 540.33 9 (⁷² Ge(p,n γ):set 2). I γ : from ⁷² Ge(p,n γ):set 2; other: 25.0<(⁷² Ge(p,n γ):set 1). $\alpha(\text{K})=0.000466$ 7; $\alpha(\text{L})=4.79\times 10^{-5}$ 7; $\alpha(\text{M})=7.29\times 10^{-6}$ 11; $\alpha(\text{N})=5.55\times 10^{-7}$ 8; $\alpha(\text{N}+..)=5.55\times 10^{-7}$ 8 E γ : weighted average of 586.4 1 (⁷² Ge(p,n γ):set 1), 586.41 4 (⁷² Ge(p,n γ):set 2). I γ : weighted average of 100 13 (⁷² Ge(p,n γ):set 1), 100 6 (⁷² Ge(p,n γ):set 2). E γ : weighted average of 179.4 1 (⁷² Ge(p,n γ):set 1), 179.16 7 (⁷² Ge(p,n γ):set 2). I γ : from ⁷² Ge(p,n γ):set 2; other: 36.0 20 (⁷² Ge(p,n γ):set 1). $\alpha(\text{K})=0.00892$ 13; $\alpha(\text{L})=0.000945$ 14; $\alpha(\text{M})=0.0001442$ 21; $\alpha(\text{N})=1.095\times 10^{-5}$ 16 $\alpha(\text{N}+..)=1.095\times 10^{-5}$ 16 E γ : weighted average of 230.7 1 (⁷² Ge(p,n γ):set 1), 230.68 7 (⁷² Ge(p,n γ):set 2). I γ : from ⁷² Ge(p,n γ):set 2; other: 40 20 (⁷² Ge(p,n γ):set 1). $\alpha(\text{K})=0.00533$ 8; $\alpha(\text{L})=0.000561$ 8; $\alpha(\text{M})=8.57\times 10^{-5}$ 12; $\alpha(\text{N})=6.51\times 10^{-6}$ 10; $\alpha(\text{N}+..)=6.51\times 10^{-6}$ 10 E γ : weighted average of 283.9 1 (⁷² Ge(p,n γ):set 1), 283.80 5 (⁷² Ge(p,n γ):set 2). I γ : from ⁷² Ge(p,n γ):set 2; other: 100<(⁷² Ge(p,n γ):set 1).
586.42	1 ⁺ ,2 ⁺	540.45 13 586.41 4	12.1 9 100 6	46.025 0	1 ⁺ 2 ⁻	M1 [†] E1 [†]	1.30×10 ⁻³ 5.21×10 ⁻⁴	
593.55	4 ⁻	179.24 11 230.69 6 283.82 4	41 3 30.6 19 100 6	414.40 362.82 309.741	3 ⁻ 5 ⁻ 4 ⁻	 M1 M1 [†]	 0.01002 0.00598	

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
624.66	$1^+, 2^+$	110.56 [±] 10	3.2 [±] 5	514.19	(0) ⁺			
		123.28 6	100 8	501.38	2 ⁺	M1 [†]	0.0511	$\alpha(\text{K})=0.0454$ 7; $\alpha(\text{L})=0.00489$ 7; $\alpha(\text{M})=0.000748$ 11; $\alpha(\text{N})=5.65 \times 10^{-5}$ 8; $\alpha(\text{N}+..)=5.65 \times 10^{-5}$ 8 E_γ : weighted average of 123.3 1 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1), 123.27 7 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2; other: 100 8 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1).
		142.05 [±] 5	11 [±] 6	482.63	2 ⁺			
		185.88 [±] 8	10.9 [±] 7	438.74	1 ⁺ , 2 ⁺	M1 [†]	0.01737	$\alpha(\text{K})=0.01545$ 22; $\alpha(\text{L})=0.001647$ 24; $\alpha(\text{M})=0.000251$ 4; $\alpha(\text{N})=1.90 \times 10^{-5}$ 3; $\alpha(\text{N}+..)=1.90 \times 10^{-5}$ 3
		234.62 [±] 7	20.1 [±] 15	390.14	1 ⁺ , 2 ⁺	M1 [†]	0.00960	$\alpha(\text{K})=0.00855$ 12; $\alpha(\text{L})=0.000905$ 13; $\alpha(\text{M})=0.0001381$ 20; $\alpha(\text{N})=1.049 \times 10^{-5}$ 15 $\alpha(\text{N}+..)=1.049 \times 10^{-5}$ 15
		336.27 6	96 6	288.473	(2) ⁺	M1 [†]	0.00396	$\alpha(\text{K})=0.00353$ 5; $\alpha(\text{L})=0.000370$ 6; $\alpha(\text{M})=5.65 \times 10^{-5}$ 8; $\alpha(\text{N})=4.30 \times 10^{-6}$ 6; $\alpha(\text{N}+..)=4.30 \times 10^{-6}$ 6 E_γ : weighted average of 336.4 1 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1), 336.24 5 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2; other: 100 30 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1).
		578.55 [±] 5	81 [±] 5	46.025	1 ⁺	M1+E2 [†]	0.0014 3	$\alpha(\text{K})=0.00123$ 24; $\alpha(\text{L})=0.00013$ 3; $\alpha(\text{M})=2.0 \times 10^{-5}$ 4; $\alpha(\text{N})=1.5 \times 10^{-6}$ 3; $\alpha(\text{N}+..)=1.5 \times 10^{-6}$ 3
		624.55 [±] 6	26.4 [±] 15	0	2 ⁻			
		162.19 [±] 9	1.65 [±] 18	482.63	2 ⁺			
		254.76 [±] 10	2.8 [±] 5	390.14	1 ⁺ , 2 ⁺	M1+E2 [†]	0.016 9	$\alpha(\text{K})=0.014$ 8; $\alpha(\text{L})=0.0016$ 9; $\alpha(\text{M})=0.00024$ 13; $\alpha(\text{N})=1.8 \times 10^{-5}$ 10; $\alpha(\text{N}+..)=1.8 \times 10^{-5}$ 10
644.84	2 ⁺	598.82 4	100 6	46.025	1 ⁺	M1 [†]	1.04 $\times 10^{-3}$	$\alpha(\text{K})=0.000924$ 13; $\alpha(\text{L})=9.57 \times 10^{-5}$ 14; $\alpha(\text{M})=1.460 \times 10^{-5}$ 21; $\alpha(\text{N})=1.115 \times 10^{-6}$ 16 $\alpha(\text{N}+..)=1.115 \times 10^{-6}$ 16 E_γ : weighted average of 598.9 1 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1), 598.81 4 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2; other: 100 9 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1).
		644.79 18	3.60 23	0	2 ⁻			E_γ : weighted average of 644.5 2 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1), 644.90 12 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2; other: 9.1 $\times 10^{-5}$ ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1).
		210.33 7	20.6 17	439.88	3 ⁺	M1+E2 [†]	0.031 19	$\alpha(\text{K})=0.028$ 17; $\alpha(\text{L})=0.0031$ 19; $\alpha(\text{M})=0.0005$ 3; $\alpha(\text{N})=3.4 \times 10^{-5}$ 21; $\alpha(\text{N}+..)=3.4 \times 10^{-5}$ 21 E_γ : weighted average of 210.5 2 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1), 210.30 8 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 2; other: 9 3 ($^{72}\text{Ge}(\text{p}, \text{n}\gamma)$:set 1).
650.16	3 ⁺	331.99 5	47 3	318.19	4 ⁺	M1 [†]	0.00408	$\alpha(\text{K})=0.00364$ 5; $\alpha(\text{L})=0.000382$ 6; $\alpha(\text{M})=5.83 \times 10^{-5}$ 9;

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
650.16	3 ⁺	361.65 4	100 7	288.473	(2) ⁺	M1 [†]	0.00332	$\alpha(\text{N})=4.43\times 10^{-6}$ 7; $\alpha(\text{N}+..)=4.43\times 10^{-6}$ 7 E_γ : weighted average of 332.0 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 331.98 6 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 11.2<($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1). $\alpha(\text{K})=0.00296$ 5; $\alpha(\text{L})=0.000310$ 5; $\alpha(\text{M})=4.73\times 10^{-5}$ 7; $\alpha(\text{N})=3.60\times 10^{-6}$ 5; $\alpha(\text{N}+..)=3.60\times 10^{-6}$ 5 E_γ : weighted average of 361.7 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 361.64 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 100 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1).
662.86	6 ⁻	604.19 [‡] 8 300.04 7	19.6 [‡] 11 100	46.025 1 ⁺ 362.82 5 ⁻		M1+E2	0.010 5	$\alpha(\text{K})=0.008$ 4; $\alpha(\text{L})=0.0009$ 5; $\alpha(\text{M})=0.00014$ 7; $\alpha(\text{N})=1.0\times 10^{-5}$ 5; $\alpha(\text{N}+..)=1.0\times 10^{-5}$ 5 E_γ : weighted average of 300.2 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 299.94 11 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2), 299.9 2 ($^{59}\text{Co}(^{19}\text{F},\alpha\text{p}\text{n}\gamma)$, $^{65}\text{Cu}(^{12}\text{C},\alpha\text{n}\gamma)$), 300.0 2 ($^{70}\text{Ge}(\alpha,\text{n}\text{p}\gamma)$, $^{72}\text{Ge}(\alpha,3\text{n}\text{p}\gamma)$), 299.9 2 ($^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$). Mult.: from $^{69}\text{Ga}(\alpha,\text{n}\gamma)$; other: M1 $^{62}\text{Ni}(^{13}\text{C},\text{p}2\text{n}\gamma)$.
673.63	2 ⁺	107.88 [‡] 10 283.48 6	0.9 [‡] 3 29.6 18	565.71 1 ⁺ ,2 ⁺ 390.14 1 ⁺ ,2 ⁺		M1 [†]	0.00600	$\alpha(\text{K})=0.00534$ 8; $\alpha(\text{L})=0.000563$ 8; $\alpha(\text{M})=8.59\times 10^{-5}$ 12; $\alpha(\text{N})=6.53\times 10^{-6}$ 10; $\alpha(\text{N}+..)=6.53\times 10^{-6}$ 10 E_γ : weighted average of 283.8 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 283.47 6 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 100<($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1). $\alpha(\text{K})=0.000832$ 12; $\alpha(\text{L})=8.61\times 10^{-5}$ 12; $\alpha(\text{M})=1.314\times 10^{-5}$ 19; $\alpha(\text{N})=1.004\times 10^{-6}$ 14 $\alpha(\text{N}+..)=1.004\times 10^{-6}$ 14 E_γ : weighted average of 627.8 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 627.61 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 80 20 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1). E_γ : weighted average of 673.7 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 673.61 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 55 7 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1).
		627.65 8	89 5	46.025 1 ⁺	1 ⁺	M1	9.32×10 ⁻⁴	$\alpha(\text{K})=0.000832$ 12; $\alpha(\text{L})=8.61\times 10^{-5}$ 12; $\alpha(\text{M})=1.314\times 10^{-5}$ 19; $\alpha(\text{N})=1.004\times 10^{-6}$ 14 $\alpha(\text{N}+..)=1.004\times 10^{-6}$ 14 E_γ : weighted average of 627.8 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 627.61 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 80 20 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1). E_γ : weighted average of 673.7 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 673.61 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 55 7 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1).
708.07	(5) ⁻	345.26 16		362.82 5 ⁻	5 ⁻	M1	0.00371	$\alpha(\text{K})=0.00331$ 5; $\alpha(\text{L})=0.000347$ 5; $\alpha(\text{M})=5.30\times 10^{-5}$ 8; $\alpha(\text{N})=4.03\times 10^{-6}$ 6; $\alpha(\text{N}+..)=4.03\times 10^{-6}$ 6 E_γ : weighted average of 345.3 2 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 345.19 26 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). Mult.: from $^{69}\text{Ga}(\alpha,\text{n}\gamma)$. E_γ : Observed only by $^{69}\text{Ga}(\alpha,\text{n}\gamma)$.
715.32	3 ⁺	398 300.95 24 397.11 5	6.2 9 46 3	309.741 4 ⁻ 414.40 3 ⁻ 318.19 4 ⁺	4 ⁻ 3 ⁻ 4 ⁺	M1 [†]	0.00266	$\alpha(\text{K})=0.00237$ 4; $\alpha(\text{L})=0.000248$ 4; $\alpha(\text{M})=3.78\times 10^{-5}$ 6; $\alpha(\text{N})=2.88\times 10^{-6}$ 4; $\alpha(\text{N}+..)=2.88\times 10^{-6}$ 4

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
715.32	3 ⁺	501.60 22	100 6	213.563	3 ⁺	(M1) [†]	1.55×10 ⁻³	$\alpha(\text{K})=0.001379$ 20; $\alpha(\text{L})=0.0001433$ 21; $\alpha(\text{M})=2.19\times 10^{-5}$ 3; $\alpha(\text{N})=1.668\times 10^{-6}$ 24 $\alpha(\text{N}+..)=1.668\times 10^{-6}$ 24
729.52	3 ⁻	715.39 8	14 4	0	2 ⁻			
		170.38 [‡] 16	8.4 [‡] 7	559.00	4 ⁻			
		315.02 [‡] 14	4.3 [‡] 4	414.40	3 ⁻			
		419.91 13	43 3	309.741	4 ⁻	M1+E2 [†]	0.0034 11	$\alpha(\text{K})=0.0030$ 10; $\alpha(\text{L})=0.00032$ 11; $\alpha(\text{M})=4.9\times 10^{-5}$ 16; $\alpha(\text{N})=3.7\times 10^{-6}$ 12; $\alpha(\text{N}+..)=3.7\times 10^{-6}$ 12 E_γ : weighted average of 420.1 1 (⁷² Ge(p,n γ):set 1), 419.82 7 (⁷² Ge(p,n γ):set 2). I_γ : from ⁷² Ge(p,n γ):set 2; other: 77 15 (⁷² Ge(p,n γ):set 1).
		729.52 5	100 6	0	2 ⁻	M1 [†]	6.70×10 ⁻⁴	$\alpha(\text{K})=0.000598$ 9; $\alpha(\text{L})=6.18\times 10^{-5}$ 9; $\alpha(\text{M})=9.42\times 10^{-6}$ 14; $\alpha(\text{N})=7.20\times 10^{-7}$ 10; $\alpha(\text{N}+..)=7.20\times 10^{-7}$ 10 E_γ : weighted average of 729.5 2 (⁷² Ge(p,n γ):set 1), 729.52 5 (⁷² Ge(p,n γ):set 2). I_γ : from ⁷² Ge(p,n γ):set 2; other: 100 18 (⁷² Ge(p,n γ):set 1).
732.50	(0 to 4) ⁻	732.50 5	100	0	2 ⁻	E2 [†]	8.46×10 ⁻⁴	$\alpha(\text{K})=0.000754$ 11; $\alpha(\text{L})=7.89\times 10^{-5}$ 11; $\alpha(\text{M})=1.203\times 10^{-5}$ 17; $\alpha(\text{N})=9.10\times 10^{-7}$ 13 $\alpha(\text{N}+..)=9.10\times 10^{-7}$ 13 E_γ : weighted average of 732.4 2 (⁷² Ge(p,n γ):set 1), 732.51 5 (⁷² Ge(p,n γ):set 2).
742.71	4 to 7	379.89 15	100	362.82	5 ⁻			E_γ : weighted average of 380.3 3 (⁷² Ge(p,n γ):set 1), 379.83 11 (⁷² Ge(p,n γ):set 2).
744.99	4 ⁻ ,5 ⁻ ,6 ⁻	151		593.55	4 ⁻			E_γ : observed only by ⁶⁹ Ga(α ,n γ).
		382.17 5	100	362.82	5 ⁻	M1 [#]	0.00291	$\alpha(\text{K})=0.00260$ 4; $\alpha(\text{L})=0.000272$ 4; $\alpha(\text{M})=4.15\times 10^{-5}$ 6; $\alpha(\text{N})=3.16\times 10^{-6}$ 5; $\alpha(\text{N}+..)=3.16\times 10^{-6}$ 5
746.96	2 ⁺ ,3 ⁺	181.25 [‡] 7	24.6 [‡] 22	565.71	1 ⁺ ,2 ⁺			
		264.43 [‡] 12	4.3 [‡] 8	482.63	2 ⁺			
		356.91 [‡] 9	16.2 [‡] 16	390.14	1 ⁺ ,2 ⁺			
		458.41 7	62 4	288.473	(2) ⁺	M1(+E2) [†]	0.0026 8	$\alpha(\text{K})=0.0023$ 7; $\alpha(\text{L})=0.00025$ 7; $\alpha(\text{M})=3.8\times 10^{-5}$ 11; $\alpha(\text{N})=2.8\times 10^{-6}$ 8; $\alpha(\text{N}+..)=2.8\times 10^{-6}$ 8 E_γ : weighted average of 458.6 2 (⁷² Ge(p,n γ):set 1), 458.39 7 (⁷² Ge(p,n γ):set 2). I_γ : from ⁷² Ge(p,n γ):set 2; other:<100 (⁷² Ge(p,n γ):set 1).
		533.28 7	31.3 17	213.563	3 ⁺	M1(+E2) [†]	0.0017 4	$\alpha(\text{K})=0.0015$ 4; $\alpha(\text{L})=0.00016$ 4; $\alpha(\text{M})=2.5\times 10^{-5}$ 6; $\alpha(\text{N})=1.9\times 10^{-6}$ 4; $\alpha(\text{N}+..)=1.9\times 10^{-6}$ 4 E_γ : weighted average of 533.5 10 (⁷² Ge(p,n γ):set 1), 533.28 7 (⁷² Ge(p,n γ):set 2). I_γ : from ⁷² Ge(p,n γ):set 2.

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)									
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments	
746.96	2 ⁺ ,3 ⁺	700.99 5	100 6	46.025	1 ⁺			E_γ : weighted average of 701.0 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 700.99 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2.	
794.26	(3,4)	746.86 [±] 12	11.8 [±] 10	0	2 ⁻			E_γ : weighted average of 379.6 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 379.83 18 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 100<($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1).	
		379.77 15	2.9 10	414.40	3 ⁻			E_γ : weighted average of 794.2 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 794.26 5 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). I_γ : from $^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2; other: 24 9 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1).	
800.27	1,2	794.26 5	100 7	0	2 ⁻				
		126.58 [±] 10	11 [±] 6	673.63	2 ⁺				
		213.88 [±] 24	10.7 [±] 7	586.42	1 ⁺ ,2 ⁺				
		234.64 [±] 25	14.1 [±] 9	565.71	1 ⁺ ,2 ⁺				
		286.06 [±] 7	22.5 [±] 18	514.19	(0) ⁺				
		420.02 [±] 8	11.1 [±] 8	380.13	0 ⁺				
		754.38 [±] 9	9.5 [±] 7	46.025	1 ⁺				
801.94	(4) ⁺	800.28 4	100 6	0	2 ⁻			E_γ : weighted average of 800.0 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 800.29 4 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). $\alpha(\text{K})=0.00479$ 7; $\alpha(\text{L})=0.000496$ 7; $\alpha(\text{M})=7.53\times 10^{-5}$ 11; $\alpha(\text{N})=5.68\times 10^{-6}$ 8; $\alpha(\text{N}+..)=5.68\times 10^{-6}$ 8	
		242.85 17	100 12	559.00	4 ⁻	E1 [#]	0.00536	E_γ : weighted average of 242.9 3 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 242.82 21 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2). E_γ : weighted average of 276.6 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 276.60 9 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2).	
		276.60 7	45 4	525.33	3 ⁻				
		387.71 17	35 5	414.40	3 ⁻	E1 [#]	1.47×10^{-3}	$\alpha(\text{K})=0.001310$ 19; $\alpha(\text{L})=0.0001353$ 19; $\alpha(\text{M})=2.06\times 10^{-5}$ 3; $\alpha(\text{N})=1.561\times 10^{-6}$ 22 $\alpha(\text{N}+..)=1.561\times 10^{-6}$ 22 E_γ : weighted average of 387.9 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 387.56 9 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2).	
806.40	1,3	416.42 8	25.3 16	390.14	1 ⁺ ,2 ⁺				
		517.97 7	41.5 23	288.473	(2) ⁺				
		592.71 5	100 7	213.563	3 ⁺				
		760.46 7	29.6 19	46.025	1 ⁺				
		806.39 22	10.1 8	0	2 ⁻				
813.32	4 to 6	495.13 9	100	318.19	4 ⁺			E_γ : weighted average of 495.2 1 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 1), 495.01 13 ($^{72}\text{Ge}(\text{p},\text{n}\gamma)$:set 2).	
816.77	1,2	251.61 16	2.6 8	565.16	1 ⁻ ,2 ⁻				
		770.74 6	30.8 22	46.025	1 ⁺				
		816.76 5	100 6	0	2 ⁻				
828.25	6 ⁺	120		708.07	(5) ⁻			E_γ : observed only by $^{69}\text{Ga}(\alpha,\text{n}\gamma)$.	

Adopted Levels, Gammas (continued)

 $\gamma(^{72}\text{As})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
828.25	6 ⁺	165		662.86	6 ⁻			E_γ : observed only by $^{69}\text{Ga}(\alpha, n\gamma)$.
		265.36 9	24.0 21	562.85	7 ⁻	E1 [#]	0.00416	$\alpha(\text{K})=0.00372$ 6; $\alpha(\text{L})=0.000385$ 6; $\alpha(\text{M})=5.85\times 10^{-5}$ 9; $\alpha(\text{N})=4.41\times 10^{-6}$ 7; $\alpha(\text{N}+..)=4.41\times 10^{-6}$ 7
								E_γ : weighted average of 265.4 1 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 265.2 2 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$).
								I_γ : weighted average of 24.5 15 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 18 3 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$), 28 3 ($^{62}\text{Ni}(^{13}\text{C}, \text{p}2n\gamma)$).
		465.46 11		362.82	5 ⁻	E1 [#]	9.15×10^{-4}	$\alpha(\text{K})=0.000817$ 12; $\alpha(\text{L})=8.42\times 10^{-5}$ 12; $\alpha(\text{M})=1.282\times 10^{-5}$ 18; $\alpha(\text{N})=9.74\times 10^{-7}$ 14
								$\alpha(\text{N}+..)=9.74\times 10^{-7}$ 14
								E_γ : weighted average of 465.8 4 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 465.5 2 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$), 465.3 2 ($^{70}\text{Ge}(\alpha, n\text{p}\gamma)$, $^{72}\text{Ge}(\alpha, 3n\text{p}\gamma)$), 465.5 2 ($^{62}\text{Ni}(^{13}\text{C}, \text{p}2n\gamma)$).
								I_γ : weighted average of 100 13 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$), 100 8 ($^{62}\text{Ni}(^{13}\text{C}, \text{p}2n\gamma)$).
834.20	6 ⁻	510 ^c		318.19	4 ⁺			E_γ : observed only by $^{69}\text{Ga}(\alpha, n\gamma)$.
		126		708.07	(5) ⁻			E_γ : Observed only by $^{69}\text{Ga}(\alpha, n\gamma)$.
		171		662.86	6 ⁻			E_γ : Observed only by $^{69}\text{Ga}(\alpha, n\gamma)$.
		271.34 12	77 12	562.85	7 ⁻	M1 [#]	0.00668	$\alpha(\text{K})=0.00595$ 9; $\alpha(\text{L})=0.000628$ 9; $\alpha(\text{M})=9.58\times 10^{-5}$ 14; $\alpha(\text{N})=7.28\times 10^{-6}$ 11; $\alpha(\text{N}+..)=7.28\times 10^{-6}$ 11
								E_γ : weighted average of 271.4 1 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 271.1 2 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$).
								I_γ : weighted average of 100 12 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 50 6 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$), 87 4 ($^{62}\text{Ni}(^{13}\text{C}, \text{p}2n\gamma)$).
		471.45 25	99 4	362.82	5 ⁻	M1 [#]	0.00178	$\alpha(\text{K})=0.001590$ 23; $\alpha(\text{L})=0.0001655$ 24; $\alpha(\text{M})=2.52\times 10^{-5}$ 4; $\alpha(\text{N})=1.93\times 10^{-6}$ 3; $\alpha(\text{N}+..)=1.93\times 10^{-6}$ 3
								E_γ : weighted average of 471.7 2 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 471.2 2 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$).
								I_γ : weighted average of 71 24 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 100 10 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha n\gamma)$), 100 5 ($^{62}\text{Ni}(^{13}\text{C}, \text{p}2n\gamma)$).
837.66	(1,2)	192.84 [‡] 9	32 [‡] 4	644.84	2 ⁺			
		271.91 [‡] 16	50 [‡] 3	565.71	1 ⁺ , 2 ⁺			
		354.89 [‡] 11	22 [‡] 7	482.63	2 ⁺			
		447.53 [‡] 15	19 [‡] 3	390.14	1 ⁺ , 2 ⁺			
		549.24 [‡] 18	100 [‡] 5	288.473	(2) ⁺			
								E_γ : weighted average of 549.5 1 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 549.11 7 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 2).
		791.69 [‡] 8	75 [‡] 5	46.025	1 ⁺			
839.91	4 ⁻ , 5 ⁻	246.50 18	23 5	593.55	4 ⁻	M1 [#]	0.00848	$\alpha(\text{K})=0.00755$ 11; $\alpha(\text{L})=0.000799$ 12; $\alpha(\text{M})=0.0001219$ 18;

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)								
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
839.91	$4^-, 5^-$	477.14 11	24 3	362.82	5^-	M1 [#]	1.36×10^{-3}	$\alpha(\text{N})=9.26 \times 10^{-6}$ 13 $\alpha(\text{N}+..)=9.26 \times 10^{-6}$ 13
		522		318.19	4^+			E_γ : Observed only by $^{69}\text{Ga}(\alpha, n\gamma)$.
		530.09 9	100 6	309.741	4^-			$\alpha(\text{K})=0.001216$ 17; $\alpha(\text{L})=0.0001262$ 18; $\alpha(\text{M})=1.93 \times 10^{-5}$ 3; $\alpha(\text{N})=1.470 \times 10^{-6}$ 21 $\alpha(\text{N}+..)=1.470 \times 10^{-6}$ 21
841.46	(2,3)	401.38 6	60 4	439.88	3^+			E_γ : weighted average of 401.4 1 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 401.37 7 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 2).
		427.06 6	94 6	414.40	3^-			E_γ : weighted average of 427.3 1 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 427.06 6 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 2).
843.79	1,2	841.66 [‡] 6	100 [‡] 6	0	2^-			
		193.75 20	2.9 9	650.16	3^+			
		199.01 12	4.9 9	644.84	2^+			
		361.30 24	9.7 13	482.63	2^+			
		404.92 9	4.6 13	438.74	$1^+, 2^+$			
		555.38 7	17.9 11	288.473	$(2)^+$			
		797.72 14	13.5 8	46.025	1^+			
866.91	4^-	843.78 5	100 6	0	2^-	M1 [#]	0.00196	E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$.
		159		708.07	$(5)^-$			$\alpha(\text{K})=0.001748$ 25; $\alpha(\text{L})=0.000182$ 3; $\alpha(\text{M})=2.78 \times 10^{-5}$ 4; $\alpha(\text{N})=2.12 \times 10^{-6}$ 3; $\alpha(\text{N}+..)=2.12 \times 10^{-6}$ 3
		452.5 2	36 10	414.40	3^-			E_γ, I_γ : from (p, n γ) set 1.
981.13	8^+	504.1 1	100 20	362.82	5^-	M1 [#]	1.53×10^{-3}	$\alpha(\text{K})=0.001363$ 19; $\alpha(\text{L})=0.0001417$ 20; $\alpha(\text{M})=2.16 \times 10^{-5}$ 3; $\alpha(\text{N})=1.649 \times 10^{-6}$ 24 $\alpha(\text{N}+..)=1.649 \times 10^{-6}$ 24 E_γ, I_γ : from (p, n γ) set 1.
		557		309.741	4^-	E2 [#]	0.1621	E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$.
		152.7 [@] 2	7.9 18	828.25	6^+			$\alpha(\text{K})=0.1423$ 21; $\alpha(\text{L})=0.0170$ 3; $\alpha(\text{M})=0.00258$ 4; $\alpha(\text{N})=0.000182$ 3; $\alpha(\text{N}+..)=0.000182$ 3 B(E2)(W.u.)=69 17
		318		662.86	6^-	M2 [#]	0.0193	$\alpha(\text{K})=0.01711$ 24; $\alpha(\text{L})=0.00191$ 3; $\alpha(\text{M})=0.000292$ 4; $\alpha(\text{N})=2.20 \times 10^{-5}$ 3; $\alpha(\text{N}+..)=2.20 \times 10^{-5}$ 3
		418.34 11	100 9	562.85	7^-	E1 [#]	1.20×10^{-3}	E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$. $\alpha(\text{N})=1.279 \times 10^{-6}$ 18 B(E1)(W.u.)=1.22 $\times 10^{-5}$ 16 E_γ : weighted average of 418.9 2 ($^{72}\text{Ge}(\text{p}, n\gamma)$:set 1), 418.3 1 ($^{59}\text{Co}(^{19}\text{F}, \alpha \text{pn}\gamma)$, $^{65}\text{Cu}(^{12}\text{C}, \alpha \text{n}\gamma)$), 418.1 2 ($^{70}\text{Ge}(\alpha, \text{np}\gamma)$, $^{72}\text{Ge}(\alpha, 3\text{np}\gamma)$), 418.3 1 ($^{62}\text{Ni}(^{13}\text{C}, \text{p}2\text{n}\gamma)$). I_γ : from $^{70}\text{Ge}(\alpha, \text{np}\gamma)$, $^{72}\text{Ge}(\alpha, 3\text{np}\gamma)$.

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)									
$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	δ	α^b	Comments
1033.55	(5) ⁺	205.3 <i>1</i>		828.25	6 ⁺	M1+E2 [#]		0.034 <i>21</i>	$\alpha(\text{K})=0.030$ <i>18</i> ; $\alpha(\text{L})=0.0034$ <i>21</i> ; $\alpha(\text{M})=0.0005$ <i>4</i> ; $\alpha(\text{N})=3.7\times 10^{-5}$ <i>23</i> ; $\alpha(\text{N}+..)=3.7\times 10^{-5}$ <i>23</i> E_γ : from (p,n γ) set 1.
		232		801.94	(4) ⁺	M1 [#]		0.00988	$\alpha(\text{K})=0.00879$ <i>13</i> ; $\alpha(\text{L})=0.000931$ <i>13</i> ; $\alpha(\text{M})=0.0001421$ <i>20</i> ; $\alpha(\text{N})=1.079\times 10^{-5}$ <i>16</i> $\alpha(\text{N}+..)=1.079\times 10^{-5}$ <i>16</i> E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$.
1179.05	(7) ⁺	715 198 350.8 <i>1</i>	100	318.19 4 ⁺ 981.13 8 ⁺ 828.25 6 ⁺		M1 [#]		0.00357	E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$. E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$. E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$. $\alpha(\text{K})=0.00319$ <i>5</i> ; $\alpha(\text{L})=0.000334$ <i>5</i> ; $\alpha(\text{M})=5.10\times 10^{-5}$ <i>8</i> ; $\alpha(\text{N})=3.88\times 10^{-6}$ <i>6</i> ; $\alpha(\text{N}+..)=3.88\times 10^{-6}$ <i>6</i> E_γ : from (p,n γ) set 1.
1191.1	4 ⁺ ,5 ⁺	363 389		828.25 6 ⁺ 801.94 (4) ⁺		M1+E2 [#]		0.0042 <i>15</i>	$\alpha(\text{K})=0.0038$ <i>13</i> ; $\alpha(\text{L})=0.00040$ <i>15</i> ; $\alpha(\text{M})=6.1\times 10^{-5}$ <i>22</i> ; $\alpha(\text{N})=4.6\times 10^{-6}$ <i>16</i> ; $\alpha(\text{N}+..)=4.6\times 10^{-6}$ <i>16</i>
1346.33	(7) ⁻	512.0 [@] <i>3</i> 683 783.5 [@] <i>2</i>	1.0 $\times 10^2$ <i>5</i> 53 <i>10</i>	834.20 6 ⁻ 662.86 6 ⁻ 562.85 7 ⁻		M1(+E2) [#]		0.00064 <i>7</i>	E_γ : Observed only in $^{69}\text{Ga}(\alpha, n\gamma)$. $\alpha(\text{K})=0.00057$ <i>6</i> ; $\alpha(\text{L})=5.9\times 10^{-5}$ <i>7</i> ; $\alpha(\text{M})=9.1\times 10^{-6}$ <i>10</i> ; $\alpha(\text{N})=6.9\times 10^{-7}$ <i>8</i> ; $\alpha(\text{N}+..)=6.9\times 10^{-7}$ <i>8</i>
1401.82	9 ⁺	420.7 [@] <i>2</i>	100	981.13 8 ⁺		M1 [#]		0.00232	$\alpha(\text{K})=0.00207$ <i>3</i> ; $\alpha(\text{L})=0.000216$ <i>3</i> ; $\alpha(\text{M})=3.30\times 10^{-5}$ <i>5</i> ; $\alpha(\text{N})=2.51\times 10^{-6}$ <i>4</i> ; $\alpha(\text{N}+..)=2.51\times 10^{-6}$ <i>4</i>
1665.64	(8) ⁻	319.3 [@] <i>2</i>	23 <i>6</i>	1346.33 (7) ⁻		M1+E2 ^a		0.008 <i>4</i>	$\alpha(\text{K})=0.007$ <i>3</i> ; $\alpha(\text{L})=0.0008$ <i>4</i> ; $\alpha(\text{M})=0.00011$ <i>5</i> ; $\alpha(\text{N})=9.\text{E}-6$ <i>4</i> ; $\alpha(\text{N}+..)=9.\text{E}-6$ <i>4</i>
1875.05	10 ⁺	831.5 [@] <i>2</i> 473.6 [@] <i>4</i> 893.9 [@] <i>2</i>	100 <i>11</i> 8 <i>5</i> 100 <i>17</i>	834.20 6 ⁻ 1401.82 9 ⁺ 981.13 8 ⁺		E2 ^a		5.06 $\times 10^{-4}$	$\alpha(\text{K})=0.000452$ <i>7</i> ; $\alpha(\text{L})=4.70\times 10^{-5}$ <i>7</i> ; $\alpha(\text{M})=7.16\times 10^{-6}$ <i>10</i> ; $\alpha(\text{N})=5.44\times 10^{-7}$ <i>8</i> ; $\alpha(\text{N}+..)=5.44\times 10^{-7}$ <i>8</i> B(E2)(W.u.)=57 <i>24</i>
2133.79	(9) ⁻	468.2 [@] <i>3</i>	76 <i>17</i>	1665.64 (8) ⁻		M1+E2 ^a		0.0025 <i>7</i>	$\alpha(\text{K})=0.0022$ <i>6</i> ; $\alpha(\text{L})=0.00023$ <i>7</i> ; $\alpha(\text{M})=3.5\times 10^{-5}$ <i>10</i> ; $\alpha(\text{N})=2.7\times 10^{-6}$ <i>8</i> ; $\alpha(\text{N}+..)=2.7\times 10^{-6}$ <i>8</i>
		787.4 [@] <i>2</i>	100 <i>14</i>	1346.33 (7) ⁻		E2 ^a		6.99 $\times 10^{-4}$	$\alpha(\text{K})=0.000623$ <i>9</i> ; $\alpha(\text{L})=6.51\times 10^{-5}$ <i>10</i> ; $\alpha(\text{M})=9.91\times 10^{-6}$ <i>14</i> ; $\alpha(\text{N})=7.51\times 10^{-7}$ <i>11</i> ; $\alpha(\text{N}+..)=7.51\times 10^{-7}$ <i>11</i>
2307.60	11 ⁺	432.6 [@] <i>2</i>	100 <i>11</i>	1875.05 10 ⁺		M1+E2 ^a	-0.08	0.00219	$\alpha(\text{K})=0.00195$ <i>3</i> ; $\alpha(\text{L})=0.000204$ <i>3</i> ; $\alpha(\text{M})=3.11\times 10^{-5}$ <i>5</i> ; $\alpha(\text{N})=2.37\times 10^{-6}$ <i>4</i> ; $\alpha(\text{N}+..)=2.37\times 10^{-6}$ <i>4</i> B(E2)(W.u.)=32 <i>20</i> ; B(M1)(W.u.)=0.7 <i>4</i>
		905.7 [@] <i>2</i>	52 <i>10</i>	1401.82 9 ⁺		E2 ^a		4.90 $\times 10^{-4}$	$\alpha(\text{K})=0.000437$ <i>7</i> ; $\alpha(\text{L})=4.55\times 10^{-5}$ <i>7</i> ; $\alpha(\text{M})=6.93\times 10^{-6}$ <i>10</i> ; $\alpha(\text{N})=5.26\times 10^{-7}$ <i>8</i> ; $\alpha(\text{N}+..)=5.26\times 10^{-7}$ <i>8</i> B(E2)(W.u.)=7.E+1 <i>5</i>

Adopted Levels, Gammas (continued)

$\gamma(^{72}\text{As})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^b	Comments
2326.4	(10 ⁻)	924.6 3	100	1401.82	9 ⁺	(E1)	1.94×10^{-4}	$\alpha(K)=0.0001738$ 25; $\alpha(L)=1.778 \times 10^{-5}$ 25; $\alpha(M)=2.71 \times 10^{-6}$ 4; $\alpha(N)=2.07 \times 10^{-7}$ 3; $\alpha(N+..)=2.07 \times 10^{-7}$ 3
2516.92	(10 ⁻)	383.0 @ 3	38 10	2133.79	(9 ⁻)	M1+E2 ^a	0.0045 16	$\alpha(K)=0.0040$ 14; $\alpha(L)=0.00042$ 16; $\alpha(M)=6.4 \times 10^{-5}$ 24; $\alpha(N)=4.8 \times 10^{-6}$ 17; $\alpha(N+..)=4.8 \times 10^{-6}$ 17
		851.3 @ 2	100 13	1665.64	(8 ⁻)	E2 ^a	5.72×10^{-4}	$\alpha(K)=0.000510$ 8; $\alpha(L)=5.31 \times 10^{-5}$ 8; $\alpha(M)=8.10 \times 10^{-6}$ 12; $\alpha(N)=6.14 \times 10^{-7}$ 9; $\alpha(N+..)=6.14 \times 10^{-7}$ 9
2925.0	(11 ⁻)	598.6 @ 2	100	2326.4	(10 ⁻)			
3043.9	(11 ⁻)	526.9 @ 3	44 12	2516.92	(10 ⁻)	(M1+E2) ^a	0.0018 4	$\alpha(K)=0.0016$ 4; $\alpha(L)=0.00017$ 4; $\alpha(M)=2.5 \times 10^{-5}$ 6; $\alpha(N)=1.9 \times 10^{-6}$ 5; $\alpha(N+..)=1.9 \times 10^{-6}$ 5
		910.2 @ 3	100 16	2133.79	(9 ⁻)			
3151.2	12 ⁺	843.7 @ 3	28 13	2307.60	11 ⁺			
		1276.3 @ 4	100 25	1875.05	10 ⁺	E2 ^{&}	2.46×10^{-4}	$\alpha(K)=0.000199$ 3; $\alpha(L)=2.05 \times 10^{-5}$ 3; $\alpha(M)=3.13 \times 10^{-6}$ 5; $\alpha(N)=2.39 \times 10^{-7}$ 4; $\alpha(N+..)=2.29 \times 10^{-5}$ 4 B(E2)(W.u.)=33 16
3445.7	(12 ⁻)	928.8 @ 3	100	2516.92	(10 ⁻)	E2 ^a	4.61×10^{-4}	$\alpha(K)=0.000411$ 6; $\alpha(L)=4.27 \times 10^{-5}$ 6; $\alpha(M)=6.51 \times 10^{-6}$ 10; $\alpha(N)=4.95 \times 10^{-7}$ 7; $\alpha(N+..)=4.95 \times 10^{-7}$ 7
3504.8	13 ⁺	353.7 3	24 22	3151.2	12 ⁺			E_γ, I_γ : Not observed in (¹³ C,p2n γ) or (²⁸ Si,3p γ).
		1197.0 @ 3	100 19	2307.60	11 ⁺	E2 ^{&}	2.65×10^{-4}	$\alpha(K)=0.000229$ 4; $\alpha(L)=2.36 \times 10^{-5}$ 4; $\alpha(M)=3.60 \times 10^{-6}$ 5; $\alpha(N)=2.74 \times 10^{-7}$ 4; $\alpha(N+..)=8.33 \times 10^{-6}$ 13 B(E2)(W.u.)=6.E+1 3
4777.8	(15 ⁺)	1273.0 @ 7	100	3504.8	13 ⁺	E2 ^{&}	2.46×10^{-4}	$\alpha(K)=0.000200$ 3; $\alpha(L)=2.06 \times 10^{-5}$ 3; $\alpha(M)=3.15 \times 10^{-6}$ 5; $\alpha(N)=2.40 \times 10^{-7}$ 4; $\alpha(N+..)=2.22 \times 10^{-5}$ 4 B(E2)(W.u.)=43 14
6088.0	(17 ⁺)	1310.2 @ 4	100	4777.8	(15 ⁺)			

† From ⁷²Ge(p,n γ):set 2.

‡ Observed only in ⁷²Ge(p,n γ):set 2.

From ⁶⁹Ga(α ,n γ).

@ From ⁵⁹Co(¹⁹F, α p γ), ⁶⁵Cu(¹²C, α n γ).

& From ⁵⁹Co(¹⁹F, α p γ), ⁶⁵Cu(¹²C, α n γ).

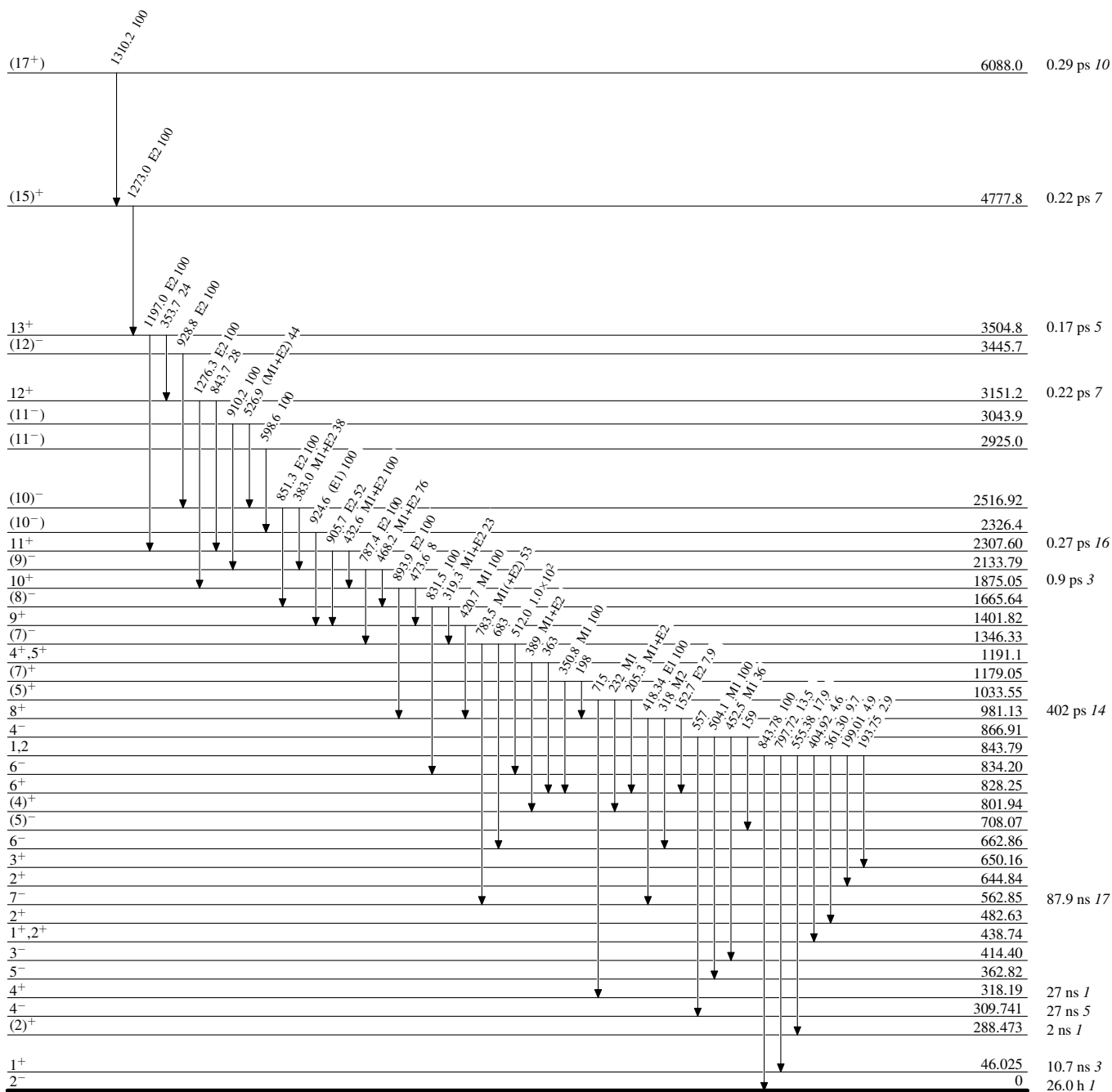
^a From ⁶²Ni(¹³C,p2n γ).

^b Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

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

Adopted Levels, Gammas**Level Scheme**

Intensities: Relative photon branching from each level

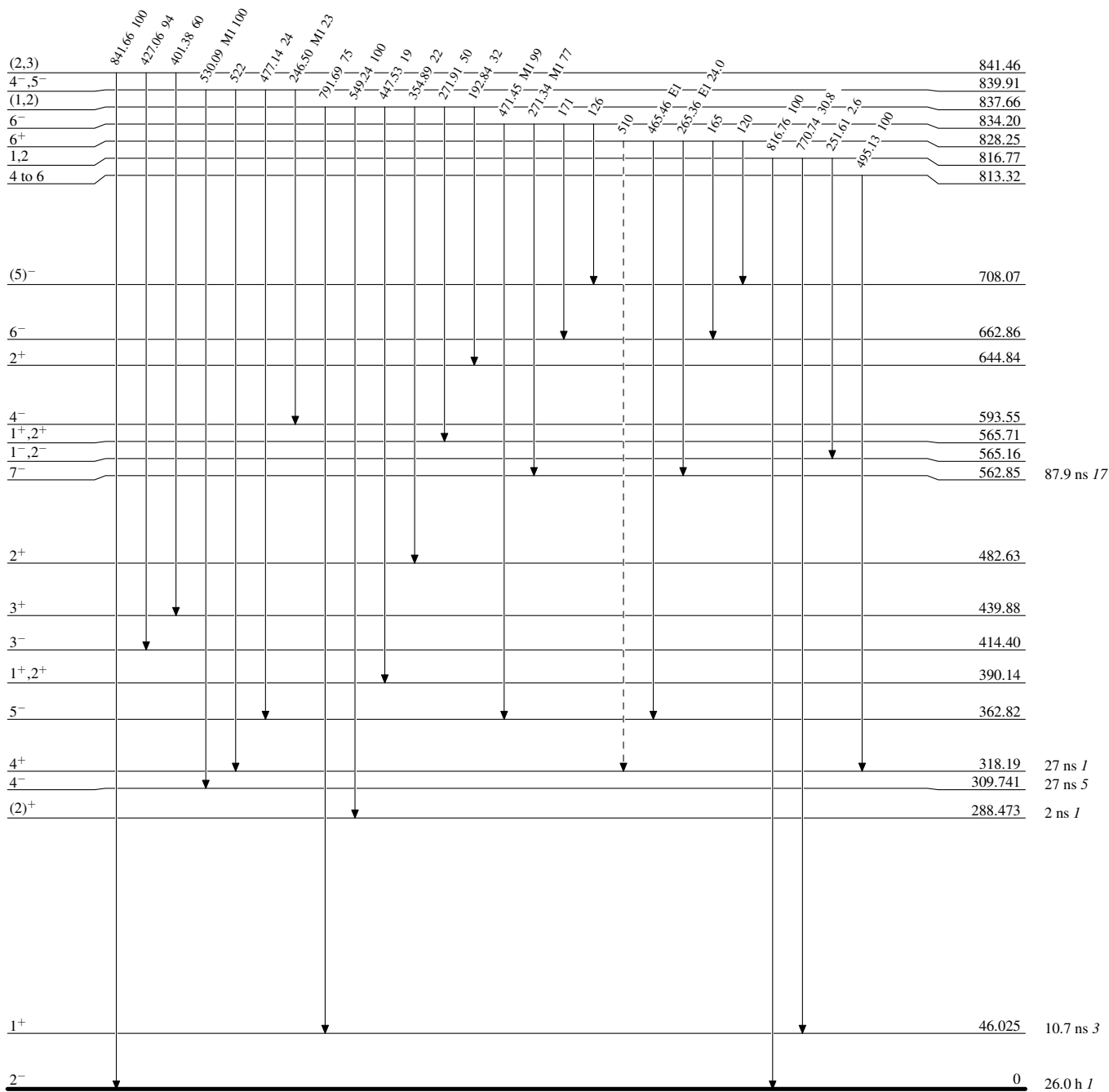


Adopted Levels, Gammas

Legend

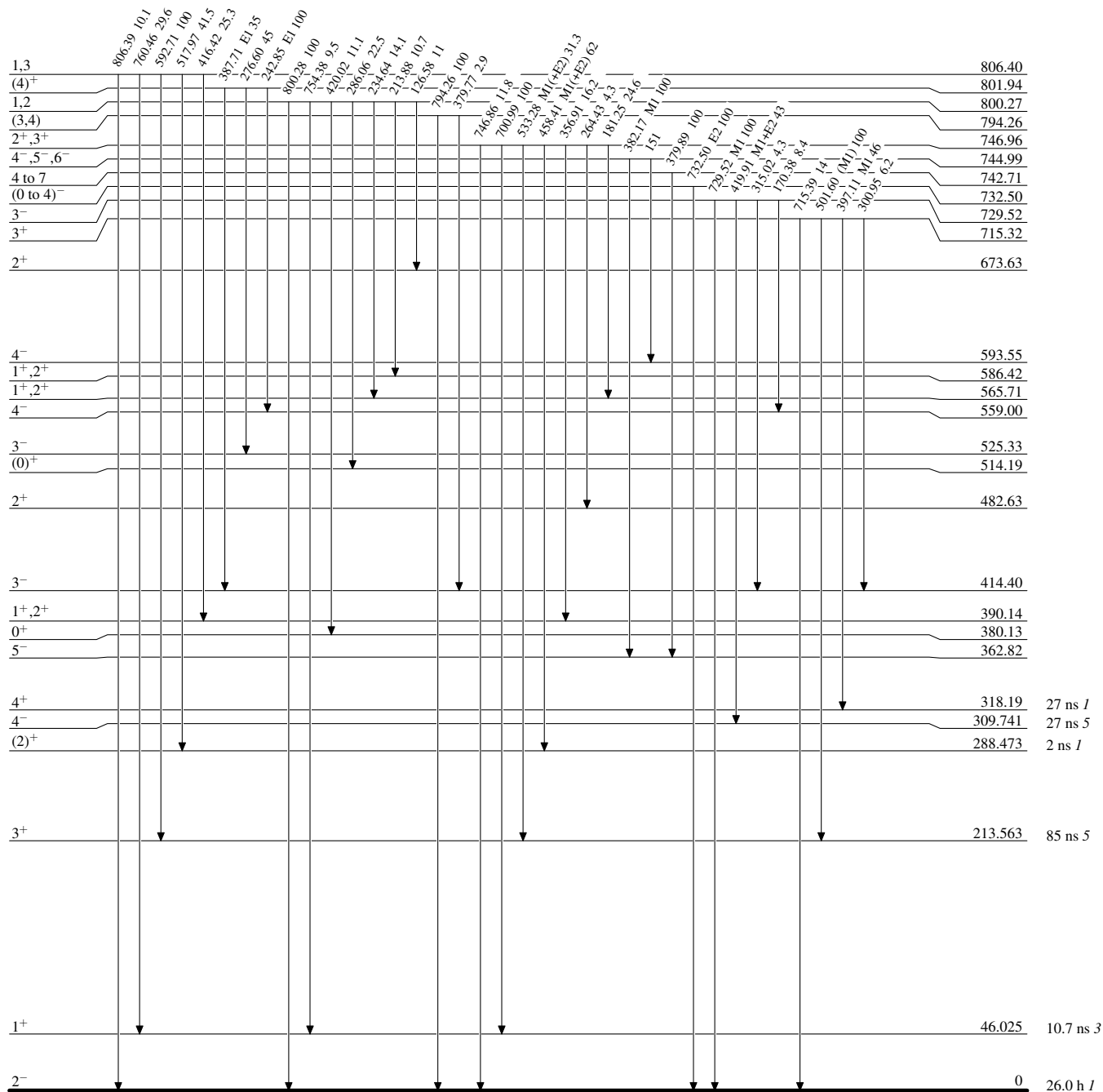
Level Scheme (continued)

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain) $^{72}_{33}\text{As}_{39}$

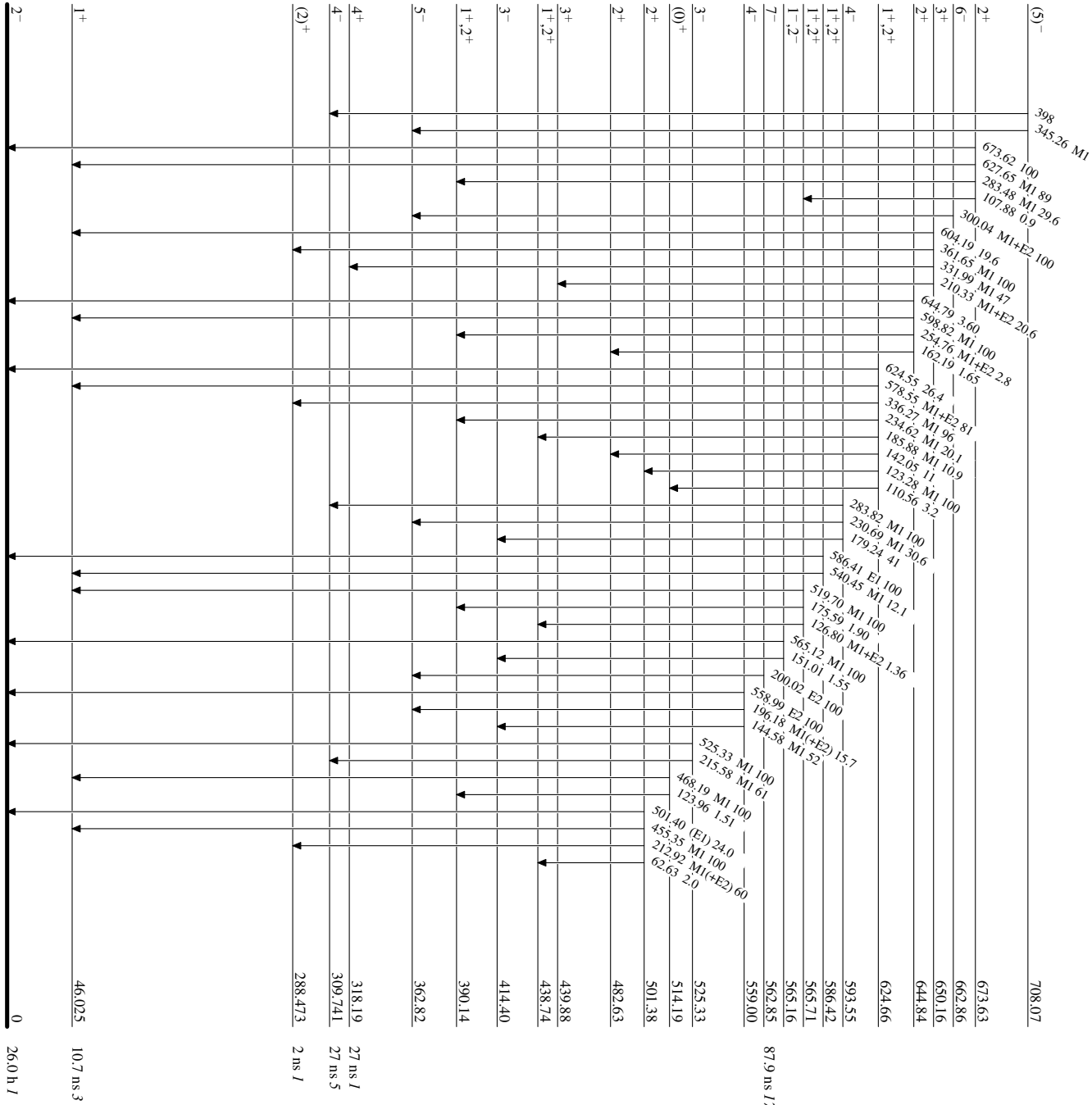
Adopted Levels, GammasLevel Scheme (continued)

Intensities: Relative photon branching from each level

 $^{72}_{33}\text{As}_{39}$

Adopted Levels, Gammas
Level Scheme (continued)

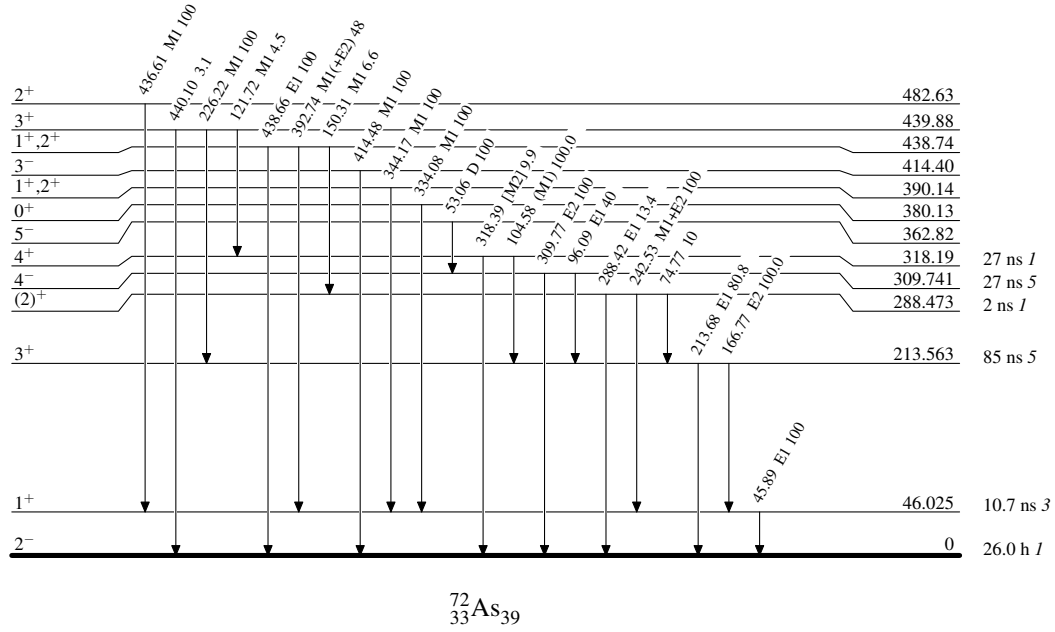
Intensities: Relative photon branching from each level



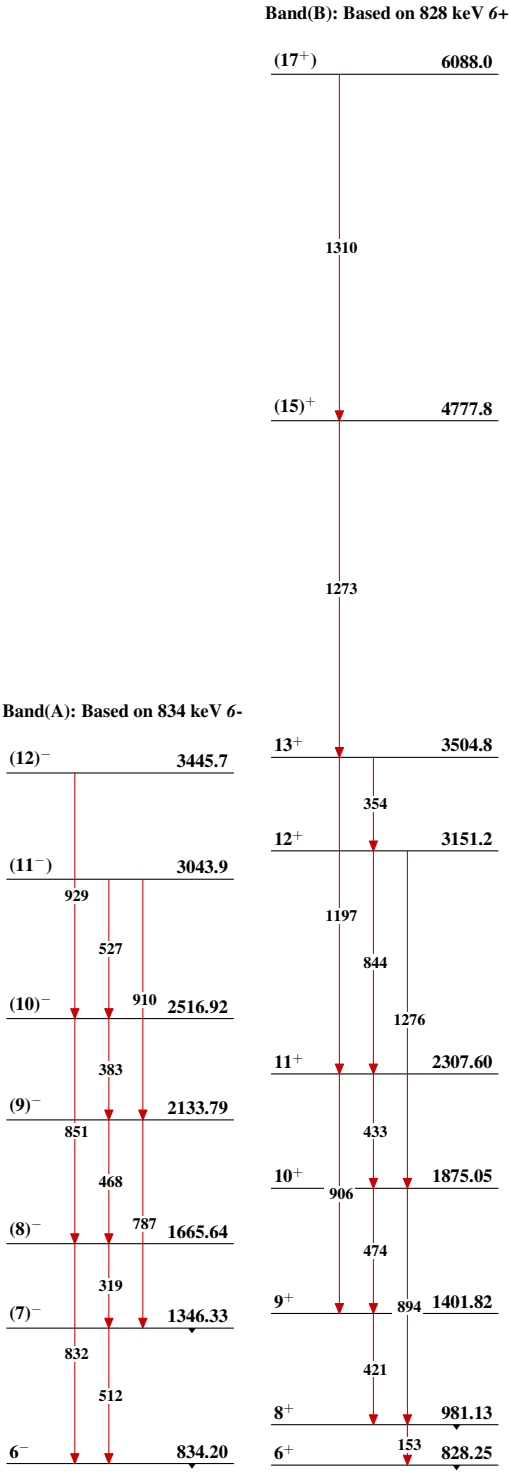
⁷²As₃₉

Adopted Levels, Gammas**Level Scheme (continued)**

Intensities: Relative photon branching from each level



Adopted Levels, Gammas



$^{72}_{33}\text{As}_{39}$