Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 154, 1 (2018)	20-Nov-2018

Q(β^-)=9380 *12*; S(n)=3207 *13*; S(p)=10690 *13*; Q(α)=−1524 *13* 2017Wa10
Q(β^-n)=3967 *12* (2017Wa10).
Level scheme is from 2017Mo19.

^{140}I Levels

Cross Reference (XREF) Flags

A ^{140}Te β^- decay

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0.0	(4$^-$)	0.86 s *4*		%β^-=100; %β^-n=7.60 *28* J$^\pi$: assigned by 1999Li18 based on significant β^- to ^{140}Xe 2$^+$, 4$^+$, and 6$^+$ levels ($\beta\gamma\gamma$(t) method), for which no values are given (possibly in their Ref. [16] "to be published", not retrieved by evaluator, probably unpublished; H. Mach confirmed to evaluator in Dec. 2005 that there is supplementary unpublished data). This value updates the formerly evaluated values, (3) (1994Pe19), and (3)$^{(-)}$ (2003Au02). $T_{1/2}$: from 1976Ah01. Others: 0.88 s *13* (1974Kr21), 0.86 s *14* (1970HeZH), 0.88 s *12* (1970WiZN). Delayed neutron emission probability=7.60% *28* (2017AgZZ); Others: 9.3% *10* (1993Ru01,1983ReZX,1984Ma39), 9.2% *6* (1980Al15), 21.7% *56* (1978Kr15); see also 1976NiZZ, 1975Is03, 1974Kr21, 1973To16.
0.0+x	(2$^-$)		A	%β^-=?; %β^-n=?; %IT=? Decay modes of this state are not known. E(level),J$^\pi$: based on beta-decay feeding from ^{140}Te parent 0$^+$ g.s. and γ transitions from the levels populated by β^- decay, 2017Mo19 propose this level with J^π=(2$^-$), different from the known (4$^-$) ^{140}I g.s. with half-life of 0.86 s. Energy and half-life of the (2$^-$) state are not given by 2017Mo19, but the authors refer about this state to a private communication (their reference 17). Consequently this level is assumed at higher energy than the (4$^-$) g.s. (hence this level scheme is built on the 0.0+x level).
5.47+x *15*	(1$^-$)		A	
43.25+x *13*	(1$^-$,2$^-$)		A	
51.48+x *10*	(1$^-$,2$^-$)		A	
107.47+x *11*	(0$^-$,1$^-$,2$^-$)		A	
120.94+x *9*	(1$^-$,2$^-$)		A	
142.31+x *13*	(1$^-$,2$^-$)		A	
185.68+x *11*	(1$^-$,2$^-$)		A	
234.94+x *13*	(0$^-$,1$^-$,2$^-$)		A	
342.07+x *13*	(0$^-$,1$^-$)		A	
459.37+x *23*	(1$^-$,2$^-$)		A	
490.21+x *13*	(1$^-$,2$^-$)		A	
639.31+x *16*	(0$^-$,1$^-$,2$^-$)		A	
727.70+x *13*	(0$^-$,1$^-$,2$^-$)		A	
842.12+x *12*	(0$^-$,1$^-$,2$^-$)		A	
881.46+x *17*	(0$^-$,1$^-$,2$^-$)		A	
925.44+x *10*	(1$^+$)		A	Proposed configuration=π3/2[541]⊗ν1/2[541] (2017Mo19, β^- decay).
1188.00+x *12*	(1$^+$)		A	
1786.91+x *13*	(1$^+$)		A	

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Adopted Levels, Gammas (continued)

^{140}I Levels (continued)

† From a least-squares fit to Eγ values, assuming 0.2 keV uncertainty for Eγ when not stated, except 0.5 keV for 875.0γ as it is fitted poorly in the level scheme. Values given by 2017Mo19 are fairly close to those listed here, but with uncertainties that are generally higher by a factor of 2-5.

‡ Except for the g.s., assigned by 2017Mo19 in the β^- decay based on their shell-model calculations, and partly based on log *ft* values.

γ(^{140}I)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α†	Comments
43.25+x	(1⁻,2⁻)	44.0 *10*	100	0.0+x	(2⁻)	[M1]	8.0 *6*	ce(K)/(γ+ce)=0.76 *3*; ce(L)/(γ+ce)=0.101 *9*; ce(M)/(γ+ce)=0.0204 *20* ce(N)/(γ+ce)=0.0041 *4*; ce(O)/(γ+ce)=0.00048 *5* α(K)=6.9 *5*; α(L)=0.91 *7*; α(M)=0.184 *14* α(N)=0.037 *3*; α(O)=0.0043 *3*
51.48+x	(1⁻,2⁻)	51.4	100	0.0+x	(2⁻)	[M1]	5.10	ce(K)/(γ+ce)=0.718 *6*; ce(L)/(γ+ce)=0.0949 *17*; ce(M)/(γ+ce)=0.0191 *4* ce(N)/(γ+ce)=0.00387 *7*; ce(O)/(γ+ce)=0.000451 *9* α(K)=4.38 *7*; α(L)=0.579 *9*; α(M)=0.1167 *17* α(N)=0.0236 *4*; α(O)=0.00275 *4*
107.47+x	(0⁻,1⁻,2⁻)	56.0 *1*	22 *3*	51.48+x	(1⁻,2⁻)	[M1]	3.97	ce(K)/(γ+ce)=0.686 *6*; ce(L)/(γ+ce)=0.0905 *17*; ce(M)/(γ+ce)=0.0182 *4* ce(N)/(γ+ce)=0.00369 *7*; ce(O)/(γ+ce)=0.000431 *9* α(K)=3.41 *5*; α(L)=0.450 *7*; α(M)=0.0908 *14* α(N)=0.0184 *3*; α(O)=0.00214 *4*
		102.0	100 *7*	5.47+x	(1⁻)	[M1]	0.707	ce(K)/(γ+ce)=0.356 *4*; ce(L)/(γ+ce)=0.0466 *7*; ce(M)/(γ+ce)=0.00939 *15* ce(N)/(γ+ce)=0.00190 *3*; ce(O)/(γ+ce)=0.000222 *4* α(K)=0.608 *9*; α(L)=0.0795 *12*; α(M)=0.01603 *23* α(N)=0.00324 *5*; α(O)=0.000379 *6*
120.94+x	(1⁻,2⁻)	77.7 *1*	100 *12*	43.25+x	(1⁻,2⁻)	[M1]	1.539	ce(K)/(γ+ce)=0.521 *5*; ce(L)/(γ+ce)=0.0684 *11*; ce(M)/(γ+ce)=0.01379 *24* ce(N)/(γ+ce)=0.00279 *5*; ce(O)/(γ+ce)=0.000326 *6* α(K)=1.322 *20*; α(L)=0.174 *3*; α(M)=0.0350 *5* α(N)=0.00708 *11*; α(O)=0.000828 *12*
		120.9 *1*	23 *3*	0.0+x	(2⁻)	[M1]	0.437	ce(K)/(γ+ce)=0.262 *3*; ce(L)/(γ+ce)=0.0341 *5*; ce(M)/(γ+ce)=0.00688 *11* ce(N)/(γ+ce)=0.001393 *21*; ce(O)/(γ+ce)=0.0001630 *25* α(K)=0.376 *6*; α(L)=0.0491 *7*; α(M)=0.00989 *14* α(N)=0.00200 *3*; α(O)=0.000234 *4*
142.31+x	(1⁻,2⁻)	142.4	100	0.0+x	(2⁻)	[M1]	0.277	ce(K)/(γ+ce)=0.1866 *22*; ce(L)/(γ+ce)=0.0243 *4*; ce(M)/(γ+ce)=0.00489 *7* ce(N)/(γ+ce)=0.000990 *15*; ce(O)/(γ+ce)=0.0001159 *17* α(K)=0.238 *4*; α(L)=0.0310 *5*; α(M)=0.00624 *9* α(N)=0.001264 *18*; α(O)=0.0001480 *21*
185.68+x	(1⁻,2⁻)	134.2 *1*	83 *7*	51.48+x	(1⁻,2⁻)	[M1]	0.327	ce(K)/(γ+ce)=0.2118 *24*; ce(L)/(γ+ce)=0.0276 *4*; ce(M)/(γ+ce)=0.00556 *8* ce(N)/(γ+ce)=0.001125 *17*; ce(O)/(γ+ce)=0.0001317 *20*

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Adopted Levels, Gammas (continued)

γ(^{140}I) (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	$\alpha^\dagger$	Comments
								α(K)=0.281 *4*; α(L)=0.0366 *6*; α(M)=0.00737 *11* α(N)=0.001492 *22*; α(O)=0.0001747 *25* ce(K)/(γ+ce)=0.1016 *13*; ce(L)/(γ+ce)=0.01313 *19*; ce(M)/(γ+ce)=0.00264 *4* ce(N)/(γ+ce)=0.000535 *8*; ce(O)/(γ+ce)=6.28×10^{-5} *9*
185.68+x	(1$^-$,2$^-$)	185.6	100 *8*	0.0+x	(2$^-$)	[M1]	0.1338	α(K)=0.1152 *17*; α(L)=0.01488 *21*; α(M)=0.00300 *5* α(N)=0.000607 *9*; α(O)=7.11×10^{-5} *10* ce(K)/(γ+ce)=0.294 *4*; ce(L)/(γ+ce)=0.0384 *6*; ce(M)/(γ+ce)=0.00773 *12* ce(N)/(γ+ce)=0.001564 *25*; ce(O)/(γ+ce)=0.000183 *3*
234.94+x	(0$^-$,1$^-$,2$^-$)	113.8 *2*	91 *13*	120.94+x	(1$^-$,2$^-$)	[M1]	0.518	α(K)=0.446 *7*; α(L)=0.0582 *9*; α(M)=0.01174 *18* α(N)=0.00238 *4*; α(O)=0.000278 *5* ce(K)/(γ+ce)=0.0606 *8*; ce(L)/(γ+ce)=0.00778 *11*; ce(M)/(γ+ce)=0.001566 *22* ce(N)/(γ+ce)=0.000317 *5*; ce(O)/(γ+ce)=3.72×10^{-5} *6*
		229.4	100 *10*	5.47+x	(1$^-$)	[M1]	0.0756	α(K)=0.0652 *10*; α(L)=0.00837 *12*; α(M)=0.001684 *24* α(N)=0.000341 *5*; α(O)=4.00×10^{-5} *6* ce(K)/(γ+ce)=0.0574 *8*; ce(L)/(γ+ce)=0.00737 *11*; ce(M)/(γ+ce)=0.001482 *21* ce(N)/(γ+ce)=0.000300 *5*; ce(O)/(γ+ce)=3.52×10^{-5} *5*
342.07+x	(0$^-$,1$^-$)	234.5	89 *6*	107.47+x	(0$^-$,1$^-$,2$^-$)	[M1]	0.0713	α(K)=0.0615 *9*; α(L)=0.00789 *11*; α(M)=0.001588 *23* α(N)=0.000322 *5*; α(O)=3.77×10^{-5} *6* ce(K)/(γ+ce)=0.0224 *3*; ce(L)/(γ+ce)=0.00284 *4*; ce(M)/(γ+ce)=0.000570 *8* ce(N)/(γ+ce)=0.0001154 *17*; ce(O)/(γ+ce)=1.358×10^{-5} *19*
		342.1	100 *6*	0.0+x	(2$^-$)	[M1]	0.0266	α(K)=0.0230 *4*; α(L)=0.00291 *4*; α(M)=0.000585 *9* α(N)=0.0001185 *17*; α(O)=1.394×10^{-5} *20* ce(K)/(γ+ce)=0.0208 *3*; ce(L)/(γ+ce)=0.00264 *4*; ce(M)/(γ+ce)=0.000531 *8* ce(N)/(γ+ce)=0.0001075 *15*; ce(O)/(γ+ce)=1.264×10^{-5} *18*
459.37+x	(1$^-$,2$^-$)	351.9	100	107.47+x	(0$^-$,1$^-$,2$^-$)	[M1]	0.0247	α(K)=0.0214 *3*; α(L)=0.00271 *4*; α(M)=0.000544 *8* α(N)=0.0001102 *16*; α(O)=1.296×10^{-5} *19* ce(K)/(γ+ce)=0.01693 *24*; ce(L)/(γ+ce)=0.00214 *3*; ce(M)/(γ+ce)=0.000430 *6* ce(N)/(γ+ce)=8.71×10^{-5} *13*;
490.21+x	(1$^-$,2$^-$)	382.6	100	107.47+x	(0$^-$,1$^-$,2$^-$)	[M1]	0.0200	

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Adopted Levels, Gammas (continued)

$\gamma(^{140}I)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	$\alpha^\dagger$	Comments
								ce(O)/(γ+ce)=1.024×10^{-5} *15* α(K)=0.01727 *25*; α(L)=0.00218 *3*; α(M)=0.000438 *7* α(N)=8.88×10^{-5} *13*; α(O)=1.045×10^{-5} *15*
639.31+x	(0$^-$,1$^-$,2$^-$)	497.0 *1*	100	142.31+x	(1$^-$,2$^-$)	[M1]	0.01039	α(K)=0.00899 *13*; α(L)=0.001126 *16*; α(M)=0.000226 *4* α(N)=4.58×10^{-5} *7*; α(O)=5.40×10^{-6} *8*
727.70+x	(0$^-$,1$^-$,2$^-$)	620.3 *1*	71 *8*	107.47+x	(0$^-$,1$^-$,2$^-$)	[M1]	0.00606	α(K)=0.00525 *8*; α(L)=0.000652 *10*; α(M)=0.0001307 *19* α(N)=2.65×10^{-5} *4*; α(O)=3.13×10^{-6} *5*
		722.3	100 *7*	5.47+x	(1$^-$)	[M1]	0.00421	α(K)=0.00365 *6*; α(L)=0.000451 *7*; α(M)=9.05×10^{-5} *13* α(N)=1.83×10^{-5} *3*; α(O)=2.17×10^{-6} *3*
842.12+x	(0$^-$,1$^-$,2$^-$)	734.7 *1*	68 *33*	107.47+x	(0$^-$,1$^-$,2$^-$)	[M1]	0.00405	α(K)=0.00351 *5*; α(L)=0.000433 *6*; α(M)=8.69×10^{-5} *13* α(N)=1.761×10^{-5} *25*; α(O)=2.08×10^{-6} *3*
		790.6 *1*	100 *10*	51.48+x	(1$^-$,2$^-$)	[M1]	0.00341	α(K)=0.00295 *5*; α(L)=0.000364 *5*; α(M)=7.30×10^{-5} *11* α(N)=1.479×10^{-5} *21*; α(O)=1.747×10^{-6} *25*
881.46+x	(0$^-$,1$^-$,2$^-$)	646.5 *2*	36 *7*	234.94+x	(0$^-$,1$^-$,2$^-$)	[M1]	0.00548	α(K)=0.00475 *7*; α(L)=0.000590 *9*; α(M)=0.0001182 *17* α(N)=2.40×10^{-5} *4*; α(O)=2.83×10^{-6} *4*
		830.0	100 *9*	51.48+x	(1$^-$,2$^-$)	[M1]	0.00304	α(K)=0.00264 *4*; α(L)=0.000325 *5*; α(M)=6.50×10^{-5} *10* α(N)=1.319×10^{-5} *19*; α(O)=1.558×10^{-6} *22*
925.44+x	(1$^+$)	198.1	73 *6*	727.70+x	(0$^-$,1$^-$,2$^-$)	[E1]	0.0303	ce(K)/(γ+ce)=0.0254 *4*; ce(L)/(γ+ce)=0.00321 *5*; ce(M)/(γ+ce)=0.000641 *9* ce(N)/(γ+ce)=0.0001286 *18*; ce(O)/(γ+ce)=1.466×10^{-5} *21* α(K)=0.0262 *4*; α(L)=0.00330 *5*; α(M)=0.000661 *10* α(N)=0.0001325 *19*; α(O)=1.510×10^{-5} *22*
		435.2 *1*	8.0 *18*	490.21+x	(1$^-$,2$^-$)	[E1]	0.00389	α(K)=0.00337 *5*; α(L)=0.000415 *6*; α(M)=8.30×10^{-5} *12* α(N)=1.675×10^{-5} *24*; α(O)=1.95×10^{-6} *3*
		583.3 *2*	7.4 *18*	342.07+x	(0$^-$,1$^-$)	[E1]	0.00197	α(K)=0.001708 *24*; α(L)=0.000208 *3*; α(M)=4.16×10^{-5} *6* α(N)=8.41×10^{-6} *12*; α(O)=9.82×10^{-7} *14*
		739.8	100 *6*	185.68+x	(1$^-$,2$^-$)	[E1]	1.18×10^{-3}	α(K)=0.001024 *15*; α(L)=0.0001240 *18*;

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Adopted Levels, Gammas (continued)

$\gamma(^{140}I)$ (continued)

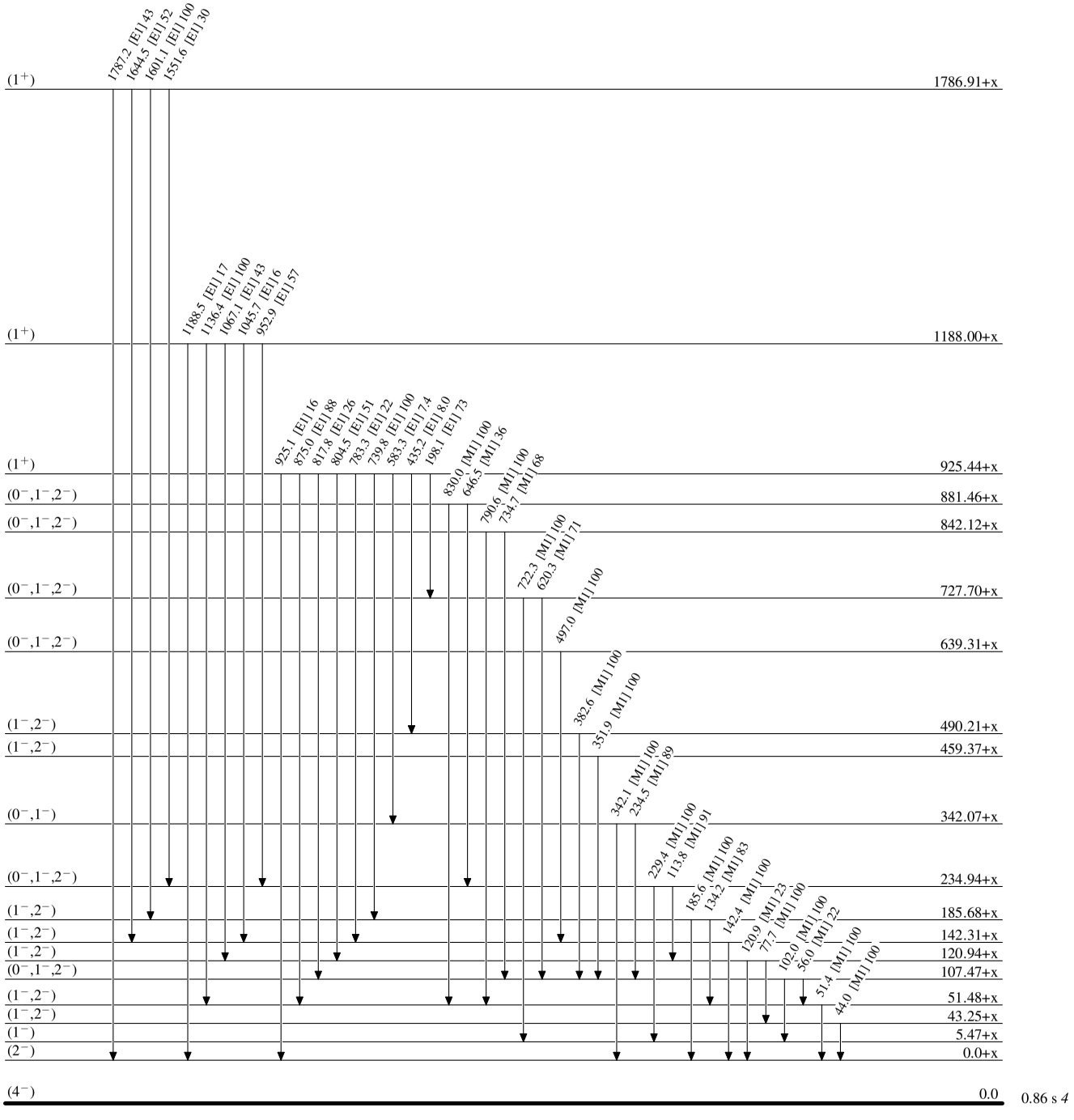
E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α[†]	Comments
								α(M)=2.48×10^{-5} *4* α(N)=5.01×10^{-6} *7*; α(O)=5.87×10^{-7} *9*
925.44+x	(1$^+$)	783.3	22 *2*	142.31+x	(1$^-$,2$^-$)	[E1]	1.05×10^{-3}	α(K)=0.000910 *13*; α(L)=0.0001100 *16*; α(M)=2.20×10^{-5} *3* α(N)=4.44×10^{-6} *7*; α(O)=5.21×10^{-7} *8*
		804.5 *2*	51 *6*	120.94+x	(1$^-$,2$^-$)	[E1]	9.92×10^{-4}	α(K)=0.000862 *12*; α(L)=0.0001041 *15*; α(M)=2.08×10^{-5} *3* α(N)=4.21×10^{-6} *6*; α(O)=4.93×10^{-7} *7*
		817.8	26 *2*	107.47+x	(0$^-$,1$^-$,2$^-$)	[E1]	9.60×10^{-4}	α(K)=0.000834 *12*; α(L)=0.0001007 *14*; α(M)=2.01×10^{-5} *3* α(N)=4.07×10^{-6} *6*; α(O)=4.77×10^{-7} *7*
		875.0	88 *6*	51.48+x	(1$^-$,2$^-$)	[E1]	8.39×10^{-4}	α(K)=0.000729 *11*; α(L)=8.78×10^{-5} *13*; α(M)=1.753×10^{-5} *25* α(N)=3.55×10^{-6} *5*; α(O)=4.17×10^{-7} *6* E_γ: poor fit in the level scheme. Level-energy difference=874.0 *1*.
		925.1 *2*	16 *3*	0.0+x	(2$^-$)	[E1]	7.52×10^{-4}	α(K)=0.000654 *10*; α(L)=7.86×10^{-5} *11*; α(M)=1.570×10^{-5} *22* α(N)=3.18×10^{-6} *5*; α(O)=3.73×10^{-7} *6*
1188.00+x	(1$^+$)	952.9	57 *5*	234.94+x	(0$^-$,1$^-$,2$^-$)	[E1]	7.10×10^{-4}	α(K)=0.000618 *9*; α(L)=7.42×10^{-5} *11*; α(M)=1.481×10^{-5} *21* α(N)=3.00×10^{-6} *5*; α(O)=3.52×10^{-7} *5*
		1045.7 *3*	6 *3*	142.31+x	(1$^-$,2$^-$)	[E1]	5.95×10^{-4}	α(K)=0.000518 *8*; α(L)=6.21×10^{-5} *9*; α(M)=1.239×10^{-5} *18* α(N)=2.51×10^{-6} *4*; α(O)=2.95×10^{-7} *5*
		1067.1	43 *4*	120.94+x	(1$^-$,2$^-$)	[E1]	5.73×10^{-4}	α(K)=0.000499 *7*; α(L)=5.97×10^{-5} *9*; α(M)=1.192×10^{-5} *17* α(N)=2.41×10^{-6} *4*; α(O)=2.84×10^{-7} *4*
		1136.4	100 *6*	51.48+x	(1$^-$,2$^-$)	[E1]	5.20×10^{-4}	α(K)=0.000444 *7*; α(L)=5.31×10^{-5} *8*; α(M)=1.060×10^{-5} *15* α(N)=2.15×10^{-6} *3*; α(O)=2.53×10^{-7} *4*; α(IPF)=9.05×10^{-6} *13*
		1188.5 *3*	17 *5*	0.0+x	(2$^-$)	[E1]	4.98×10^{-4}	α(K)=0.000410 *6*; α(L)=4.89×10^{-5} *7*; α(M)=9.76×10^{-6} *14* α(N)=1.98×10^{-6} *3*; α(O)=2.33×10^{-7} *4*; α(IPF)=2.69×10^{-5} *4*
1786.91+x	(1$^+$)	1551.6 *4*	30 *19*	234.94+x	(0$^-$,1$^-$,2$^-$)	[E1]	5.61×10^{-4}	α(K)=0.000259 *4*; α(L)=3.07×10^{-5} *5*; α(M)=6.11×10^{-6} *9* α(N)=1.238×10^{-6} *18*; α(O)=1.462×10^{-7} *21*; α(IPF)=0.000264 *4*
		1601.1 *2*	100 *18*	185.68+x	(1$^-$,2$^-$)	[E1]	5.83×10^{-4}	α(K)=0.000245 *4*; α(L)=2.91×10^{-5} *4*; α(M)=5.80×10^{-6} *9* α(N)=1.174×10^{-6} *17*; α(O)=1.387×10^{-7} *20*; α(IPF)=0.000301 *5*
		1644.5 *2*	52 *20*	142.31+x	(1$^-$,2$^-$)	[E1]	6.04×10^{-4}	α(K)=0.000235 *4*; α(L)=2.78×10^{-5} *4*; α(M)=5.54×10^{-6} *8* α(N)=1.123×10^{-6} *16*; α(O)=1.327×10^{-7} *19*; α(IPF)=0.000334 *5*
		1787.2 *2*	43 *14*	0.0+x	(2$^-$)	[E1]	6.78×10^{-4}	α(K)=0.000205 *3*; α(L)=2.42×10^{-5} *4*; α(M)=4.83×10^{-6} *7* α(N)=9.79×10^{-7} *14*; α(O)=1.157×10^{-7} *17*; α(IPF)=0.000442 *7*

[†] Additional information 1.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



$^{140}_{53}I_{87}$