

$^{212}\text{At}$   $\alpha$  decay (0.119 s) 1976FrZO

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 108,1583 (2007)	1-Jun-2007

Parent:  $^{212}\text{At}$ :  $E=222.9$  2;  $J^\pi=(9^-)$ ;  $T_{1/2}=0.119$  s 3;  $Q(\alpha)=7817.2$  6;  $\% \alpha$  decay=100.0

$^{212}\text{At}$ -E: From  $\Delta Q(\alpha)$  for the branch to the  $^{208}\text{Bi}$  g.s. As measured in the g.s. and isomer decay of  $^{212}\text{At}$ .  $\Delta Q(\alpha)$  for the branch to the 63.0 level gives  $E=223.0$  3. The uncertainty in the calibration energy will cancel in these  $\Delta Q(\alpha)$  calculations.

$^{212}\text{At}$ - $Q(\alpha)$ : See comment on  $E\alpha$  in the g.s.  $\alpha$  decay dataset.

1976FrZO: FWHM=18 keV.

Other: 1970Re02 FWHM $\approx$ 22 keV.

 $^{208}\text{Bi}$  Levels

E(level) <sup>†</sup>	$J^\pi$	$T_{1/2}$	Comments
0.0	5 <sup>+</sup>	3.68 $\times$ 10 <sup>5</sup> y 4	
62.94 5	4 <sup>+</sup>		E(level): from $E\gamma$ . $\Delta Q(\alpha)$ gives 62.5 3.
509.6 6	6 <sup>+</sup>		
600.6 15	4 <sup>+</sup>		
627.7 7	5 <sup>+</sup>		
649.1 9	7 <sup>+</sup>		
883 2	5 <sup>+</sup>		
958.7 15	4 <sup>+</sup>		
1095.8 8	6 <sup>+</sup>		

<sup>†</sup> Except for the 63 level, as noted, the values are from  $\Delta Q(\alpha)$  relative to the g.s. branch.

 $\alpha$  radiations

$\alpha$  groups to the following levels were looked for by 1976FrZO but not found: 633 ( $I_\alpha<0.15$ ), 925 ( $I_\alpha<0.02$ ), 936 ( $I_\alpha<0.02$ ), 1033 ( $I_\alpha<0.007$ ), 1069 ( $I_\alpha<0.01$ ), 1571 ( $I_\alpha<0.007$ ). 1970Re02 report  $I_\alpha<0.4$ ,  $<0.02$ ,  $<0.02$ ,  $<0.10$ ,  $<0.03$  for the first five branches. They do not report a value for the 1571 level.

$E\alpha^\dagger$	E(level)	$I_\alpha^\ddagger@$	HF#	Comments
6812.9 8	1095.8	0.36 4	23 3	$I_\alpha$ : 1970Re02 report $I_\alpha=0.19$ 12.
6947.4 15	958.7	0.052 7	492 68	$I_\alpha$ : 1970Re02 report $I_\alpha=0.16$ 10.
7022 2	883	0.13 2	352 55	$I_\alpha$ : 1970Re02 report $I_\alpha=0.26$ 13.
7251.1 9	649.1	0.38 8	7.5 $\times$ 10 <sup>2</sup> 16	$I_\alpha$ : 1970Re02 report $I_\alpha=0.61$ 11.
7272.1 7	627.7	0.36 8	9.3 $\times$ 10 <sup>2</sup> 21	$I_\alpha$ : 1970Re02 report $I_\alpha=0.53$ 4.
7298.7 15	600.6	0.07 1	5871 85	$I_\alpha$ : 1970Re02 report $I_\alpha=0.11$ 3.
7388.0 6	509.6	0.35 2	2.30 $\times$ 10 <sup>3</sup> 15	$I_\alpha$ : 1970Re02 report $I_\alpha=0.65$ 7.
7826.7 2	62.94	67.6 6	272 8	$I_\alpha$ : 1970Re02 report $I_\alpha=67.3$ 10.
7888.0 2	0.0	30.7 5	907 30	$I_\alpha$ : 1970Re02 report $I_\alpha=29.9$ 3.

<sup>†</sup> The authors normalized the values to the value for the g.s.  $\alpha$  transition in the  $\alpha$  decay of the  $^{212}\text{At}$  g.s.. See that dataset for a discussion of the changes introduced by the evaluator.

<sup>‡</sup> From 1976FrZO. Values from 1970Re02 are given in comments.

#  $r_0(^{208}\text{Bi})=1.474$  6.

@ Absolute intensity per 100 decays.

$^{212}\text{At}$   $\alpha$  decay (0.119 s) 1976FrZO (continued) $\gamma(^{208}\text{Bi})$ 

$E_\gamma$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	$I_{(\gamma+ce)}^\dagger$	Comments
62.94 5	62.94	4 <sup>+</sup>	0.0	5 <sup>+</sup>	66.6 10	$E_\gamma$ : from 1982Lo01 In a $^{212}\text{At}$ source containing both the 0.314 s $^{212}\text{At}$ and 0.119 s $^{212}\text{At}$ decays. Other: 63 keV (1963Jo09), observed $T_{1/2}=0.13$ s. $I_\gamma$ : if $\gamma$ is M1 then $I_\gamma=7.6$ %. $I_{(\gamma+ce)}$ : from $I_\alpha$ and $^{208}\text{Bi}$ level scheme.

† Absolute intensity per 100 decays.

 $^{212}\text{At}$   $\alpha$  decay (0.119 s) 1976FrZODecay Scheme