

$^{216}\text{Po}$   $\alpha$  decay **1971Gr17,1977Ku15**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	K. Auranen and E. A. McCutchan		NDS 168, 117 (2020)	1-Aug-2020

Parent:  $^{216}\text{Po}$ :  $E=0.0$ ;  $J^\pi=0^+$ ;  $T_{1/2}=144.0$  ms 6;  $Q(\alpha)=6906.4$  5;  $\% \alpha$  decay=100.0

$^{216}\text{Po}$ - $T_{1/2}$ : from  $\alpha\alpha(t)$  (2017Na22). Others: 136 ms 6 (2018Ba44), 175 ms +13-11 (2012Be14), 144 ms 8 (2003Da24), 144 ms 8 (2003Bi13), 145 ms 2 (1963Di05), 158 ms 8 (1942Wa04), and 145 ms 15 (1911Mo01). Weighted average of all available values gives 144.1 ms 8.

1971Gr17:  $^{216}\text{Po}$  activity from  $^{228}\text{Th}$  parent activity. Measured  $E\alpha$  using magnetic spectrometer and nuclear track plates.

1977Ku15:  $^{216}\text{Po}$  activity from  $^{232}\text{U}$  decay chain. Measured  $E\gamma$ ,  $I\gamma$  using Ge(Li) detector.

Others: 2018Ba44, 2017Na22, 2012Be14, 2003Da24, 1963Di05, 1962Wa28, 1942Wa04, 1911Mo01.

$\alpha$ : Additional information 1.

 $^{212}\text{Pb}$  Levels

<u>E(level)<sup>†</sup></u>	<u><math>J^\pi</math><sup>‡</sup></u>
0.0	$0^+$
804.9 2	( $2^+$ )

<sup>†</sup> From  $E\gamma$ .

<sup>‡</sup> From the Adopted Levels.

 $\alpha$  radiations

<u><math>E\alpha</math></u>	<u>E(level)</u>	<u><math>I\alpha</math><sup>‡</sup></u>	<u>HF<sup>†</sup></u>	Comments
5985	804.9	0.0019 3	35 6	$E\alpha$ : from 1962Wa28. $I\alpha$ : weighted average of $I\alpha=0.0021\%$ 4 (1962Wa28) and $I\gamma(805\gamma)=0.0018\%$ 3 (1977Ku15). The $I\gamma$ value is relative to $I\gamma(241\gamma$ in $^{220}\text{Rn})=3.97\%$ 4 following $\alpha$ decay of $^{224}\text{Ra}$ in secular equilibrium.
6778.3 5	0.0	99.9981 3	1.0	$E\alpha$ : from 1971Gr17 as revised by 1990Ry01 to correct for new values for calibration standards. Original value in 1971Gr17 is 6778.5 keV 5. Other: 6777.2 keV 16 (1964Wa19). $I\alpha$ : from $I\alpha(5985)$ and $\Sigma I\alpha=100$ .

<sup>†</sup>  $r_0(^{212}\text{Pb})=1.54117$  28 is derived by evaluators taking HF=1.0 for the ground state to ground state transition.

<sup>‡</sup> Absolute intensity per 100 decays.

 $\gamma(^{212}\text{Pb})$ 

$I\gamma$  normalization:  $I\gamma(805\gamma)$  is given per 100  $^{216}\text{Po}$   $\alpha$  decays.

<u><math>E\gamma</math></u>	<u><math>I\gamma</math><sup>†</sup></u>	<u><math>E_i(\text{level})</math></u>	<u><math>J_i^\pi</math></u>	<u><math>E_f</math></u>	<u><math>J_f^\pi</math></u>	<u>Mult.</u>	<u><math>\alpha</math></u>	Comments
804.9 2	0.0019 3	804.9	( $2^+$ )	0.0	$0^+$	[E2]	0.01027	$\alpha(\text{K})=0.00799$ 12; $\alpha(\text{L})=0.001732$ 25; $\alpha(\text{M})=0.000417$ 6; $\alpha(\text{N})=0.0001057$ 15 $\alpha(\text{O})=2.05\times 10^{-5}$ 3; $\alpha(\text{P})=1.88\times 10^{-6}$ 3 $E\gamma$ : from 1977Ku15. $I\gamma$ : weighted average of $I\alpha(5985\alpha$ to 805 level)=0.0021% 4 (1962Wa28) and $I\gamma=0.0018\%$ 3 (1977Ku15). The $I\gamma$ value is relative to $I\gamma(241\gamma$ in $^{220}\text{Rn})=3.97\%$ 4 following $\alpha$ decay of $^{224}\text{Ra}$ in secular equilibrium.

<sup>†</sup> Absolute intensity per 100 decays.

$^{216}\text{Po}$   $\alpha$  decay 1971Gr17,1977Ku15Decay SchemeIntensities:  $I_\gamma$  per 100 parent decays