^{191}Bi α decay (12.4 s) 1985Co06,1974Le02,1972Ga27

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 110, 999 (2009)	1-Nov-2008

Parent: ^{191}Bi: E=0.0; J^{π}=(9/2$^-$); $T_{1/2}$=12.4 s *3*; Q(α)=6778 *3*; %α decay=51 *10*

^{191}Bi-%α decay: From 2007Va21. Others: %α=40-77 (1985Co06), %$\alpha\approx$40, from comparison of α yields in (particle,xn) reactions leading to Po and to Bi (1974Le02); %α=19 (1972Ga27,1966SiZZ).

Others: 2003Ke04, 1998Kr23, 1967Tr06, 1966SiZZ, 2000Sc46 (studied α decay anisotropy).

α activity assigned to ^{191}Bi on the basis of measured excitation functions for ^{159}Tb(^{40}Ar,8n) (1972Ga27,1974Le02); ^{181}Ta(^{20}Ne,10n), ^{203}Tl(^{3}He,15n) (1974Le02); ^{109}Ag(^{84}Kr,2n) (1972Ga27). α activity assigned to ^{191}Bi on the basis of the known low-lying level structure of the odd-mass Tl isotopes (1985Co06).

1998Kr23: ^{191}Bi sources from mass separated products from 1 GeV proton bombardment of ThC_2 targets; oriented by implantation at low temperature into magnetized Fe foil; measured α spectra at 14°, 51°, 90° (using Si PIN diodes, FWHM 20 or 32 keV at 6 MeV) for T=1.4 K and T<100 mK; measured γ spectra at 0°, 90°, 180° to orientation axis; determined anisotropies for 6638α and 6310α; deduced directional distribution coefficients and L=2 and L=4 mixing ratios for 9/2 to 9/2 α transition.

^{187}Tl Levels

E(level)	J^{π}[†]	$T_{1/2}$[†]	Comments
0.0	(1/2$^+$)	≈51 s	
334 *4*	(9/2$^-$)	15.60 s *12*	E(level): deduced from Eα=6309 *3* of ^{191}Bi Q(α)=6778 *3* g.s. to this level.

[†] From Adopted Levels.

α radiations

Eα	E(level)	Iα[†#]	HF[‡]	Comments
6309 *3*	334	97.1 *3*	0.82 *19*	Eα: weighted average of 6308 *3* (2003Ke04), 6311 *5* (1985Co06), 6320 *10* (1974Le02), 6320 *10* (1972Ga27), 6305 *5* (1967Tr06; originally assigned to ^{190}Bi or ^{194}Bi); value recommended in 1991Ry01. Other value: 6330 keV (1966SiZZ). Iα: other value: 95 (1974Le02). Directional distribution coefficients A_2=−0.064 *4*, A_4>0.016 *7*, mixing ratios δ_{02}=−0.032 *2*, δ_{04}=+0.10 *4* (1998Kr23) imply a 0.10% 1 L=2 admixture for this α transition.
6639 *4*	0.0	2.9 *3*	5.2×10^2 *13*	Eα: weighted average of 6639 *5* (2003Ke04), 6639 *5* (1985Co06) and 6630 keV *20* (1974Le02; originally assigned to ^{191}Bi(150 ms)); this Eα is recommended by 1991Ry01. Iα: other value: 5 (1974Le02).

[†] From 1985Co06, renormalized so Σ(Iα)=100.

[‡] From r_0=1.49 *3*, average of r_0(^{186}Hg)=1.462 *25* and r_0(^{188}Pb)= 1.511 *8* (1998Ak04), %α(^{191}Bi)=51 *10* and $T_{1/2}$(191BI)=12.4 s *3*.

[#] For absolute intensity per 100 decays, multiply by 0.51 *10*.