^{146}Pm β^- decay 1966Bu03,1968Ta09,1970Av03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. Rodionov and G. Shulyak	NDS 136, 163 (2016)	14-Jul-2016

Parent: ^{146}Pm: E=0.0; $J^\pi=3^-$; $T_{1/2}$=5.53 y *5*; Q(β^-)=1542 *3*; %β^- decay=34.3 *15*

^{146}Pm-From 2012Au07, 2012Wa38; for %β^- decay see ^{146}Pm 'Adopted Levels' dataset.

1970Av03: ^{146}Pm β^- decay [from Ta,Gd(p,X), E=660 MeV]; measured Eγ, Iγ, ce. ^{146}Sm; deduced levels, J^π, log *ft*.

1968Ta09: ^{146}Pm β^- decay [from ^{146}Nd(p,n), E=10 MeV]; measured Eγ, Iγ, $\gamma\gamma$ coin. ^{146}Sm; deduced levels, log *ft*.

1966Bu03,1960Fu05: ^{146}Pm β^- decay [from ^{148}Nd(p,3n)]; measured Eγ, Iγ, $\gamma\gamma$ coin, $\gamma\gamma(\theta)$, β^- spectra. ^{146}Sm; deduced levels, J^π, log *ft*.

1974Sc06: ^{146}Pm β^- decay [from ^{146}Nd(d,2n), E=12 MeV]; measured Eβ, Eγ. Deduced β shape factor. ^{146}Sm; deduced transitions.

Others: 1963Pa21, 1981Or03.

The ^{146}Pm β^- decay scheme is that of proposed by 1970Av03, 1968Ta09. Analysis of $\gamma\gamma$ directional correlation (633γ-747γ) cascade; (A_2=−0.074 *18*, A_4=0.006 *25*, gated 747.2γ E2), measured by 1966Bu03, is consistent with (J=3(D,Q))→(J=2(Q))→(J=0,g.s.) sequence and Q admixture <0.1% for 633 keV transition. Two nearby states were found by 1966Bu03, namely, 1380.7 keV, $J^\pi=3^-$ and 1382.0 keV, $J^\pi=4^+$ in $\varepsilon+\beta^+$ decay. Analysis of β^- decay data gives that the population of 1382.0 level is less than that for the 1380.7 level by about 10 times. (<0.2% in absolute units for this decay).

^{146}Sm Levels

E(level)	J^π[†]	Comments
0.0	0^+	
747.24 *20*	2^+	
1380.5 *3*	3^-	E(level): doublet level: 1380.278, $J^\pi=3^-$ and 1381.290 keV, $J^\pi=4^+$ in ^{146}Eu $\varepsilon+\beta^+$ decay (1966Bu03).

[†] From 'Adopted Levels'.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(162 *3*)	1380.5	2.26 *22*	8.93 *6*	av Eβ=43.39 *87*
(795 *3*)	747.24	32.0 *15*	10.06 *6*	av Eβ=259.8 *12* E(decay): 795 *3* (1974Sc06). Others: 830 *30* (1963Pa21), 780.0 *10* (1966Bu03).

[†] Net feeding on the basis of transition intensity balance calculations at the levels.

[‡] For absolute intensity per 100 decays, multiply by 0.99 *6*.

$\gamma(^{146}Sm)$

Iγ normalization: from Iγ=34.1% *15* for 747.2 keV, E2 transition; weighted average of 34.7 *18* (1966Bu03), 37.0 *55* (1968Ta09), 33.3 *35* (1970Av03) assuming (I(γ+ce) 747.2, + ^{146}Sm)+I(γ+ce) 453.8, ^{146}Nd=100% and no β^- and ($\varepsilon+\beta^+$) feedings to ^{146}Sm(g.s.) and ^{146}Nd(g.s.), correspondingly. Other: %β^-=34.0 *13*, %ε=66.0% *13* (1997Pe22, 2012Au07).

E$_\gamma$[†]	I$_\gamma$[‡@]	E$_i$(level)	J_i^π	E$_f$	J_f^π	Mult.	α[#]	Comments
633.25 *20*	2.24 *16*	1380.5	3^-	747.24	2^+	(E1)	0.00257	α(K)=0.00220 *3*; α(L)=0.000289 *4*; α(M)=6.14×10^{-5} *9* α(N)=1.388×10^{-5} *20*; α(O)=2.07×10^{-6} *3*; α(P)=1.261×10^{-7} *18* Mult.: From combination of α (1962Fu16) and Iγ data

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^{146}Pm β^- decay 1966Bu03,1968Ta09,1970Av03 (continued)

$\gamma(^{146}Sm)$ (continued)

E_γ[†]	I_γ[‡@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
								(1966Bu03). E_γ: doublet line: 633.2 and 634.5 keV in ^{146}Eu $\varepsilon+\beta^+$ decay (1966Bu03).
747.24 *20*	34.1 *15*	747.24	2^+	0.0	0^+	E2	0.00473	α(K)exp=0.0041 *2*; α(L)exp=0.00066 *6*; α(M)exp=0.00018 *2* (1981Or03) α(K)=0.00397 *6*; α(L)=0.000596 *9*; α(M)=0.0001288 *18* α(N)=2.90×10^{-5} *4*; α(O)=4.25×10^{-6} *6*; α(P)=2.34×10^{-7} *4*

† From 1974Sc06.
‡ Weighted average from 1966Bu03, 1968Ta09, 1970Av03; Iγ per 100 parent decay.
# Additional information 1.
@ Absolute intensity per 100 decays.

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Decay Scheme

Intensities: I_γ per 100 parent decays