

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia [#] , A. Chakraborty ^{##}		NDS 171, 1 (2021)	1-Jun-2020

$Q(\beta^-)=8440$ 30; $S(n)=7580$ 40; $S(p)=13290$ 70; $Q(\alpha)=-15000$ 40 [2017Wa10](#)

$Q(\beta^-n)=3.24\times 10^3$ 3 ([2017Wa10](#)).

$S(2n)=12810$ 30, $S(2p)=36.52\times 10^3$ 14 ([2017Wa10](#)).

[1970Ar01](#): First production – $^{232}\text{Th}(^{22}\text{Ne},X)$, $E=174$ MeV.

[2006Kh08](#): Measured cross section= 2112 mb 16 at magnetic rigidity ($\beta\rho$)= 2.753 Tm, $E=53.64$ MeV/u and cross section= 2048 mb 13 at $\beta\rho=2.575$ Tm, $E=46.92$ MeV/u for $\text{Si}(^{28}\text{Ne},X)$ and related reduced strong absorption radius $\langle r_0^2 \rangle = 1.170$ fm² 6. The later one is used to study the isospin dependence of the reduced strong absorption radius.

[2000Oz01](#): Measured ^{23}F production cross-sections: $\sigma_F=94$ μb 30 from ^{40}Ar fragmentation, $E=1.06$ GeV/u, on Be target.

 ^{23}F LevelsCross Reference (XREF) Flags

A	^{23}O β^- decay (97 ms)	D	$^9\text{Be}(^{36}\text{S},X\gamma)$
B	^{24}O β^-n decay	E	$^{22}\text{Ne}(^{18}\text{O},^{17}\text{F})$
C	$^4\text{He}(^{22}\text{O},^{23}\text{F}\gamma)$		

E(level) [†]	J ^π	T _{1/2}	XREF	Comments
0.0	(5/2 ⁺)	2.23 s 14	A CDE	$\% \beta^- = 100$; $\% \beta^-n < 14$ $\langle r^2 \rangle^{1/2}(^{23}\text{F}) = 2.79$ fm 4 (matter radius) (2001Oz03). J ^π : From single neutron removal cross section, core fragment longitudinal momentum distributions and calculations (2004Sa14 , 2000Sa47). L=2 and configuration $\pi d_{5/2}$ (2004Sa14). T _{1/2} : From 1974Go17 (^{23}F β^- decay) – summed yield(t) of 1702-, 1822-, 3431-, and 2734-keV γ rays in four 1.7-sec periods. $\% \beta^-n$: From 1995ReZZ and 2008ReZZ . J ^π : L=(0) in ($^{22}\text{O},^{23}\text{F}\gamma$) (2006Mi16) and $\log ft=4.3$ from 1/2 ⁺ parent (^{23}O β^- Decay).
2246 8	(1/2 ⁺)		A C E	
2920 3			A CDE	
3373 11			A C	
3831 5			A CD	
3865 15	(1/2 ⁺ , 3/2 ⁺) [‡]		A C	
3964 28			C	
4061 11	(3/2 ⁺)		A C E	J ^π : L=(2) in ($^{22}\text{O},^{23}\text{F}\gamma$) (2006Mi16) and $\log ft=4.3$ from 1/2 ⁺ parent (^{23}O β^- Decay). Configuration: $\pi d_{3/2}$ ($^{22}\text{O},^{23}\text{F}\gamma$) – 2006Mi16 .
4610 12	(1/2 ⁺ , 3/2 ⁺) [‡]		A C	
4732 69			C	
4923 13			C	
5000? 60			E	E(level): Possible multiplet.
5547 8	(1/2 ⁺ , 3/2 ⁺) [‡]		A C	
5593 15	(1/2 ⁺ , 3/2 ⁺) [‡]		A C	
6250? 80			E	E(level): Possible multiplet.
6365 60			C	
6629 25			C	
6905 41			C	
8.18×10^3 11			E	neutron unbound state.

[†] From γ ray energies, otherwise from particle dataset as of the ‘XREF’.

[‡] From $\log ft$ values from 1/2⁺ parent (^{23}O β^- Decay).

Adopted Levels, Gammas (continued)

$\gamma({}^{23}\text{F})$						
$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	I_γ	E_f	J_f^π	Comments
2246	(1/2) ⁺	2246 [‡] 8	100	0.0	(5/2) ⁺	
2920		2925 [‡] 10	100	0.0	(5/2) ⁺	
3373		3369 [‡] 13	100	0.0	(5/2) ⁺	
3831		912 [‡] 4	100	2920		
3865	(1/2 ⁺ , 3/2 ⁺)	1621 [‡] 6	56 10	2246	(1/2) ⁺	E_γ, I_γ : Reported in ${}^{23}\text{O} \beta^-$ Decay only.
		3867 [‡] 15	100 16	0.0	(5/2) ⁺	
3964		1696 [#] 28	100	2246	(1/2) ⁺	
4061	(3/2 ⁺)	4065 [‡] 16	100	0.0	(5/2) ⁺	
4610	(1/2 ⁺ , 3/2 ⁺)	1237 [‡] 4	100	3373		
4732		4732 [#] 69	100	0.0	(5/2) ⁺	
4923		2003 [#] 19	100	2920		
5547	(1/2 ⁺ , 3/2 ⁺)	1716 [‡] 6	100	3831		
5593	(1/2 ⁺ , 3/2 ⁺)	2673 [‡] 14	100	2920		
6365		3445 [#] 60	100	2920		
6629		1706 [#] 25	100	4923		
6905		3985 [#] 51	100	2920		

[†] From ${}^{23}\text{O} \beta^-$ Decay, except otherwise noted.

[‡] From weighted average of data from ${}^{23}\text{O} \beta^-$ Decay and (${}^{22}\text{O}, \text{p}2\text{n}\gamma$), considering total uncertainty of the latter dataset. Final uncertainty is the lowest input value.

[#] From (${}^{22}\text{O}, {}^{23}\text{F}\gamma$).

Adopted Levels, Gammas**Level Scheme**

Intensities: Relative photon branching from each level

