$^{38}P\beta^{-}$ decay (0.64 s) 1986Du07

History										
Туре	Author	Citation	Literature Cutoff Date							
Full Evaluation	Jun Chen	NDS 152, 1 (2018)	30-Sep-2017							

Parent: ³⁸P: E=0; $J^{\pi}=(2^{-})$; $T_{1/2}=0.64$ s 14; $Q(\beta^{-})=12240$ 70; $\%\beta^{-}$ decay=100.0

³⁸P-J^{π}: From Adopted Levels of ³⁸P. (0⁻ to 4⁻) from possible β feeding of 2⁺, 1292 state in ³⁸S.

³⁸P-T_{1/2}: From 1986Du07. The same value is adopted in Adopted Levels of ³⁸P.

1986Du07: ³⁸P ions were produced by fragmentation of a 60 MeV/nucleon ⁴⁰Ar beam on a 190 mg/cm² Be target at GANIL. Fragments were separated by the LISE spectrometer. β particles were detected with a 1-mm-thick plastic scintillator and γ rays were detected with a 174 cm³ intrinsic Ge detector. Measured E γ , I γ , decay curves. Deduced levels, parent T_{1/2}, γ -ray branching ratios.

Others: 1971Ar32, 1988Mu08, 1995ReZZ.

No level scheme is proposed in 1986Du07. The level scheme given here is as proposed in the evaluation by 1990En08 (priv. Comm. from authors of 1986Du07).

³⁸P also decays to ³⁷S by β ⁻n, $\%\beta$ ⁻n=12 5 (1995ReZZ).

Total decay energy deposit of 6653 keV 1945 calculated by RADLIST code is much lower than the expected value of 12240 keV 70, indicating that the decay scheme is incomplete.

³⁸S Levels

E(level) [†]	$J^{\pi \ddagger}$
0	0^{+}
1292.3 4	2+
3516.5 7	$(1,2^+)$
4990.5 11	(2^{+})
6005.9 11	(3 ⁻)

 † From a least-squares fit to $\gamma\text{-ray energies.}$

[‡] From Adopted Levels.

β^{-} radiations

E(decay)	E(level)	$I\beta^{-\dagger\ddagger}$	$\log ft^{\dagger}$	Comments		
(6.23×10 ³ 7)	6005.9	<8	>5.2	av Eβ=2814 50		
$(7.25 \times 10^3 \ 7)$	4990.5	<9	>5.4	av E β =3313 50		
$(8.72 \times 10^3 7)$	3516.5	<28	>5.3	av E β =4039 50		
$(1.095 \times 10^4 \ 7)$	1292.3	<44	>5.6	av E β =5135 50		

[†] All values should be treated as limits since there is no information about feeding to g.s. and a large section of the excitation region (between 6 and 12 MeV) remains unknown.

[‡] Absolute intensity per 100 decays.

$\gamma(^{38}S)$

Iy normalization: From $\Sigma Iy(1292y+3516y)=885$, deduced from $\%\beta$ -n=125 assuming no β feeding to ground state. This normalization factor should be treated as approximate since the level scheme is not well established and incomplete.

³⁸P-Q(β^{-}): From 2017Wa10.

38 **P** β^{-} decay (0.64 s) **1986Du07** (continued)

$\gamma(^{38}S)$ (continued)

Eγ	I_{γ}^{\ddagger}	E_i (level)	\mathbf{J}_i^{π}	E_f	\mathbf{J}_f^{π}	Mult. [†]
1292.3 4	100 6	1292.3	2+	0	0^+	E2
2224.3 8	23 4	3516.5	$(1,2^+)$	1292.3	2^{+}	
3516.0 10	13 4	3516.5	$(1,2^+)$	0	0^+	
3698.0 10	11 <i>3</i>	4990.5	(2^{+})	1292.3	2^{+}	
4713.3 10	10 3	6005.9	(3 ⁻)	1292.3	2^{+}	

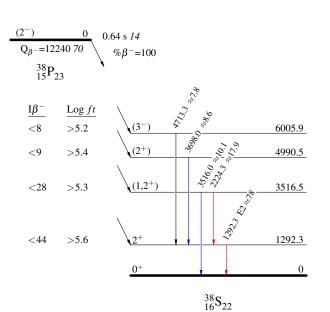
[†] From Adopted Gammas.

[‡] For absolute intensity per 100 decays, multiply by ≈ 0.78 .

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



Legend $I_{\gamma} < 2\%$

 $\begin{array}{c|c} & \mathbf{I}_{\gamma} < 2\% \times \mathbf{I}_{\gamma}^{max} \\ & \mathbf{I}_{\gamma} < 10\% \times \mathbf{I}_{\gamma}^{max} \\ & \mathbf{I}_{\gamma} > 10\% \times \mathbf{I}_{\gamma}^{max} \end{array}$