

^{38}P β^- decay (0.64 s) 1986Du07

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

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

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

^{38}P - $Q(\beta^-)$: From 2017Wa10.

1986Du07: ^{38}P ions were produced by fragmentation of a 60 MeV/nucleon ^{40}Ar 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).

^{38}P also decays to ^{37}S 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.

 ^{38}S Levels

| E(level) [†] | J^π [‡] |
|-----------------------|----------------------|
| 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 γ -ray energies.

[‡] From Adopted Levels.

 β^- radiations

| E(decay) | E(level) | $I\beta^-$ ^{†‡} | Log ft [†] | Comments |
|----------------------------|----------|--------------------------|-----------------------|---------------------|
| (6.23×10^3) 7) | 6005.9 | <8 | >5.2 | av $E\beta=2814$ 50 |
| (7.25×10^3) 7) | 4990.5 | <9 | >5.4 | av $E\beta=3313$ 50 |
| (8.72×10^3) 7) | 3516.5 | <28 | >5.3 | av $E\beta=4039$ 50 |
| (1.095×10^4) 7) | 1292.3 | <44 | >5.6 | av $E\beta=5135$ 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.

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

I_γ normalization: From $\Sigma I_\gamma(1292\gamma+3516\gamma)=88.5$, deduced from $\% \beta^-$ n=12.5 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.

Continued on next page (footnotes at end of table)

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

| E_γ | I_γ^\ddagger | $E_i(\text{level})$ | J_i^π | E_f | 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 3 | 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

