# $^{106}$Sn ε decay (115 s) 1988Ba10,1978Va20

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | D. De Frenne and A. Negret | NDS 109, 943 (2008) | 1-May-2007 |

Parent: $^{106}$Sn: E=0.0; $J^\pi=0^+$; $T_{1/2}$=115 s *5*; Q(ε)=318×10[1] *5*; %ε+%$β^+$ decay=100.0
1978Va20: $^{96}$Ru($^{16}$O,2p4n). Measured: Eγ, I, γγ, γX. Deduced: $^{106}$In levels, log *ft*, $J^\pi$.
1988Ba10: mass separated activity from $^{58}$Ni($^{58}$Ni,6p4n). Measured: Eγ, Iγ γγ, ce. Deduced $^{106}$In levels, log *ft*, $J^\pi$ Mini-orange spectrometer and several Ge(Li) detectors.
Others: 1974HsZY, 1975Bu26, 1979Pl06, 1981Bu20.
No details were given as to the γ and ce intensity scales.

## $^{106}$In Levels

Decay scheme from 1988Ba10.

| E(level) | $J^\pi$ † | $T_{1/2}$ | Comments |
|---|---|---|---|
| 0.0 | $7^+$ | 6.2 min *1* | |
| 28.6 *10* | $(2)^+$ | 5.2 min *1* | %ε+%$β^+$=100; IT decay unobserved.<br>E(level): taken from 1984Fi05 in $^{106}$Cd(p,nγ). |
| 150.9 *10* | $(2)^+$ | | |
| 203.4 *11* | $(3)^+$ | | |
| 252.7 *10* | $(3)^+$ | | |
| 505.9 *10* | $(1^+)$ | | |
| 892.3 *11* | $1^+$ | | |
| 1218.3 *11* | $1^+$ | | |
| 1602.2 *15* | $1^+$ | | |
| 1925.3 *15* | $1^+$ | | |

† From Adopted Levels.

## ε,$β^+$ radiations

As ε decay energy is 318×10[1] keV and highest detected γ only 1.9 MeV it might be that the decay scheme is incomplete and therefore the results on log *ft* an upper limit.

| E(decay) | E(level) | Iβ+ ‡ | Iε†‡ | Log *ft* | I(ε+β+)‡ | Comments |
|---|---|---|---|---|---|---|
| (1.25×10[3] *5*) | 1925.3 | 2 | 0.5 | 1.2 | 2 | av Eβ=112 *23*; εK=0.25 *25* |
| (1.58×10[3] *5*) | 1602.2 | 1.0 | 0.010 | 3.1 | 1 | av Eβ=253 *22*; εK=0.010 *4* |
| (1.96×10[3] *5*) | 1218.3 | 37 | 0.054 | 2.6 | 37 | av Eβ=420 *22*; εK=0.0015 *3*<br>E($β^+$)=923 *115* derived from measured ε/$β^+$=8 *2* via (386γ)(326γ,477γ,γ±) compared with theory (1979Pl06). |
| (2.29×10[3] *5*) | 892.3 | 59 | 0.032 | 2.9 | 59 | av Eβ=565 *23*; εK=0.00054 *8*<br>E($β^+$)=1240 *80* derived from measured ε/$β^+$=2.9 *2* via (712γ)(477γ,γ±) compared with theory (1979Pl06). |
| (2.67×10[3] *5*) | 505.9 | <0.5 | | >5.5 | <0.5 | av Eβ=738 *23* |

† From 1988Ba10.
‡ Absolute intensity per 100 decays.

## $^{106}$Sn ε decay (115 s) 1988Ba10,1978Va20 (continued)

### γ($^{106}$In)

Iγ normalization: based on Σ((I(γ+ce)) to 28.5)=100.

| $E_\gamma$ [†] | $I_\gamma$ [‡&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. [@] | α [#] | Comments |
|---|---|---|---|---|---|---|---|---|
| 49.3 *2* | ≈6.8 | 252.7 | $(3)^+$ | 203.4 | $(3)^+$ | M1 | 3.91 *6* | α(L)exp=0.45 *9*<br>α(L)=0.432 *7*. |
| 52.5 *2* | ≈7.9 | 203.4 | $(3)^+$ | 150.9 | $(2)^+$ | M1 | 3.26 *5* | ce(K)/(γ+ce)=0.663; ce(L)/(γ+ce)=0.0844; ce(M)/(γ+ce)=0.01630; ce(N)/(γ+ce)=0.00355<br>α(L)exp=0.32 *11*<br>α(L)=0.359 *5*. |
| 101.9 *2* | 4.6 | 252.7 | $(3)^+$ | 150.9 | $(2)^+$ | M1 | 0.419 *6* | ce(K)/(γ+ce)=0.284; ce(L)/(γ+ce)=0.0358; ce(M)/(γ+ce)=0.00692; ce(N)/(γ+ce)=0.00151<br>α(K)exp=0.45 *6* |
| 122.3 *1* | 46 | 150.9 | $(2)^+$ | 28.6 | $(2)^+$ | M1 | 0.290 *4* | ce(K)/(γ+ce)=0.1959; ce(L)/(γ+ce)=0.02460; ce(M)/(γ+ce)=0.00476; ce(N)/(γ+ce)=0.00104<br>α(K)exp=0.25 *3*; α(L)exp=0.0032 *4* |
| 224.1 *2* | 45 | 252.7 | $(3)^+$ | 28.6 | $(2)^+$ | | | |
| 253.2 *1* | 100 | 505.9 | $(1^+)$ | 252.7 | $(3)^+$ | | | |
| 326.2 *3* | 14 | 1218.3 | $1^+$ | 892.3 | $1^+$ | | | |
| 355.0 *1* | 3.4 | 505.9 | $(1^+)$ | 150.9 | $(2)^+$ | | | $E_\gamma$: Observed only by 1988Ba10 with I(γ+ce)=1. |
| 386.5 *2* | 134 | 892.3 | $1^+$ | 505.9 | $(1^+)$ | | | |
| 477.2 *2* | 93 | 505.9 | $(1^+)$ | 28.6 | $(2)^+$ | | | |
| 712.3 *3* | 48 | 1218.3 | $1^+$ | 505.9 | $(1^+)$ | | | |
| 863.8 *3* | 83 | 892.3 | $1^+$ | 28.6 | $(2)^+$ | | | |
| 1096.3 | 3.4 | 1602.2 | $1^+$ | 505.9 | $(1^+)$ | | | |
| 1189.6 *3* | 66 | 1218.3 | $1^+$ | 28.6 | $(2)^+$ | | | |
| 1419.4 | 7 | 1925.3 | $1^+$ | 505.9 | $(1^+)$ | | | |

[†] From 1978Va20.
[‡] From 1988Ba10. Other: 1978Va20.
[#] Conversion data from 1988Ba10.
[@] Based on α(K)exp and α(L)exp (1988Ba10).
[&] For absolute intensity per 100 decays, multiply by 0.29.

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### Decay Scheme

Intensities: $I_\gamma$ per 100 parent decays