## $^{236}$Am ε decay (2.9 min) 2005As01

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Shaofei Zhu | NDS 182, 2 (2022). | 1-Apr-2022 |

Parent: $^{236}$Am: E=x; $J^\pi$=(1$^-$); $T_{1/2}$=2.9 min *2*; Q(ε)=3139 *SY*; %ε+%$β^+$ decay≈100.0
$^{236}$Am-E: X=0 keV is used for log *ft* calculations.
$^{236}$Am-$J^\pi$,$T_{1/2}$: From the Adopted Levels of $^{236}$Am.
$^{236}$Am-Q(ε): From 2021Wa16.
$^{236}$Am-%ε+%$β^+$ decay: %α=0.004 *1* for α decay with Eα=6150 keV of g.s. or isomer of $^{236}$Am (2004Sa05).
2005As01: $^{236}$Am produced in $^{235}$U($^6$Li,5n) reaction at E=43-48 MeV; mass-separated with a resolution of M/ΔM≈800; implanted and transported to a measuring position with a short coaxial Ge detector (ORTEC LOAX) and a 35% n-type Ge detector (ORTEC GMX); Measured Eγ, Iγ, Iβ, γγ, γ-x ray coin, γ-x ray(t) coin, lifetimes. Also reported in 2004Sa05, 2002As08, 2002AsZX and 2000AsZY.
Other: 1998St02.
α: Additional information 1.

### $^{236}$Pu Levels

| E(level)† | $J^\pi$& | Comments |
|---|---|---|
| 0.0‡ | 0$^+$ | |
| 44.63‡ *9* | 2$^+$ | |
| 147.45‡ *9* | 4$^+$ | |
| 698.31# *12* | 1$^-$ | $J^\pi$: from the consistency of the expected decay branches to the g.s. $K^\pi$=0$^+$ band by Alaga rule and the measured values; proposed as the 5$^-$ member of the $K^\pi$=0$^-$ octupole vibrational band in $^{236}$Pu (2005As01). |
| 758.02# *17* | 3$^-$ | $J^\pi$: from the consistency of the expected decay branches to the g.s. $K^\pi$=0$^+$ band by Alaga rule and the measured values; proposed as the 5$^-$ member of the $K^\pi$=0$^-$ octupole vibrational band in $^{236}$Pu (2005As01). |
| 1311.51@ *23* | (0$^-$) | $J^\pi$: from systematics with $^{240}$Pu. |
| 1340.82@ *19* | (2$^-$) | $J^\pi$: from systematics with $^{240}$Pu. |

† From least-squares fit to Eγ's (by evaluator).
‡ Band(A): g.s. rotational band, $K^\pi$=0$^+$.
# Band(B): $K^\pi$=0$^-$ octupole vibrational band.
@ Band(C): $K^\pi$=0$^-$, π5/2[523]π5/2[642].
& From the Adopted Levels.

### ε,$β^+$ radiations

| E(decay) | E(level) | Iβ$^+$ ‡ | Iε‡ | Log *ft* | I(ε+$β^+$)†‡ | Comments |
|---|---|---|---|---|---|---|
| (1797 *SY*) | 1340.82 | 0.10 *2* | 68 *8* | 4.83 *6* | 68 *8* | av Eβ=376.9 *89*; εK=0.7633 *2*; εL=0.17368 *21*; εM+=0.06150 *9* |
| (1826 *SY*) | 1311.51 | 0.045 *8* | 26 *4* | 5.26 *8* | 26 *4* | av Eβ=389.8 *89*; εK=0.7635 *2*; εL=0.17339 *20*; εM+=0.06137 *9* |
| (2439# *SY*) | 698.31 | <0.18 | <14 | >5.8 | <14 | av Eβ=656.8 *87*; εK=0.7604 *4*; εL=0.16772 *20*; εM+=0.05908 *8*<br>I(ε+$β^+$): 6 +*8*−*6* as given in 2005As01. |
| (3093# *SY*) | 44.63 | <0.92 | <21 | >5.8 | <22 | av Eβ=939.6 *87*; εK=0.7413 *9*; εL=0.1606 *3*; εM+=0.05641 *10*<br>I(ε+$β^+$): combined feeding to both the ground state and the 44.63 state. |
| (3138# *SY*) | 0.0 | <0.98 | <21 | >5.8 | <22 | av Eβ=958.9 *87*; εK=0.7394 *9*; εL=0.1600 *3*; |

Continued on next page (footnotes at end of table)

## $^{236}$Am ε decay (2.9 min) 2005As01 (continued)

### ε,β+ radiations (continued)

| E(decay) | E(level) | Comments |
|---|---|---|
| | | εM+=0.05620 *10* |
| | | I(ε+β+): combined feeding to both the ground state and the 44.63-keV state. |

† From 2005As01 based on γ-ray intensity imbalance at each level assumig no missing Iε, which is estimated to be 1% *−1+8*.
‡ For absolute intensity per 100 decays, multiply by ≈1.
# Existence of this branch is questionable.

### γ($^{236}$Pu)

Iγ normalization: from 2005As01. Method for extracting absolute intensities not stated by authors.

| $E_\gamma$ † | $I_\gamma$ †‡ | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | α | Comments |
|---|---|---|---|---|---|---|---|---|
| (44.63 *10*) | | 44.63 | $2^+$ | 0.0 | $0^+$ | E2 | 741 *13* | α(L)=538 *10*; α(M)=150.1 *27*; α(N)=41.2 *7*; α(O)=9.69 *17*; α(P)=1.515 *27*; α(Q)=0.00326 *6*<br>Eγ,Mult.: from Adopted Gammas. Not measured in 2005As01 due to high internal conversion. |
| (102.82 *2*) | | 147.45 | $4^+$ | 44.63 | $2^+$ | [E2] | 13.87 *19* | α(L)=10.06 *14*; α(M)=2.82 *4*; α(N)=0.775 *11*; α(O)=0.1826 *26*; α(P)=0.0291 *4*<br>α(Q)=0.0001055 *15*<br>Eγ: from Adopted Gammas. Not measured in 2005As01 due to high internal conversion, and overlaping with the 103.7-keV Pu $K_{\alpha1}$ x ray. |
| 582.8 *2* | 139 *21* | 1340.82 | $(2^-)$ | 758.02 | $3^-$ | | | |
| 610.8 *3* | 52 *10* | 758.02 | $3^-$ | 147.45 | $4^+$ | [E1] | 0.00982 *14* | α(K)=0.00792 *11*; α(L)=0.001431 *20*; α(M)=0.000343 *5*; α(N)=9.28×10$^{-5}$ *13*<br>α(O)=2.289×10$^{-5}$ *32*; α(P)=4.24×10$^{-6}$ *6*; α(Q)=2.516×10$^{-7}$ *35* |
| 613.2 *2* | 80 *13* | 1311.51 | $(0^-)$ | 698.31 | $1^-$ | | | |
| 642.5 *2* | 73 *12* | 1340.82 | $(2^-)$ | 698.31 | $1^-$ | | | |
| 653.68 *12* | 117 *18* | 698.31 | $1^-$ | 44.63 | $2^+$ | [E1] | 0.00865 *12* | α(K)=0.00699 *10*; α(L)=0.001254 *18*; α(M)=0.000300 *4*; α(N)=8.12×10$^{-5}$ *11*<br>α(O)=2.004×10$^{-5}$ *28*; α(P)=3.72×10$^{-6}$ *5*; α(Q)=2.229×10$^{-7}$ *31* |
| 698.3 *2* | 83 *13* | 698.31 | $1^-$ | 0.0 | $0^+$ | [E1] | 0.00766 *11* | α(K)=0.00620 *9*; α(L)=0.001104 *15*; α(M)=0.000264 *4*; α(N)=7.15×10$^{-5}$ *10*<br>α(O)=1.765×10$^{-5}$ *25*; α(P)=3.28×10$^{-6}$ *5*; α(Q)=1.985×10$^{-7}$ *28* |
| 713.3 *2* | 89 *15* | 758.02 | $3^-$ | 44.63 | $2^+$ | [E1] | 0.00737 *10* | α(K)=0.00597 *8*; α(L)=0.001060 *15*; α(M)=0.000254 *4*; α(N)=6.86×10$^{-5}$ *10*<br>α(O)=1.694×10$^{-5}$ *24*; α(P)=3.15×10$^{-6}$ *4*; α(Q)=1.912×10$^{-7}$ *27* |

† From 2005As01, except where noted.
‡ For absolute intensity per 100 decays, multiply by ≈0.27.

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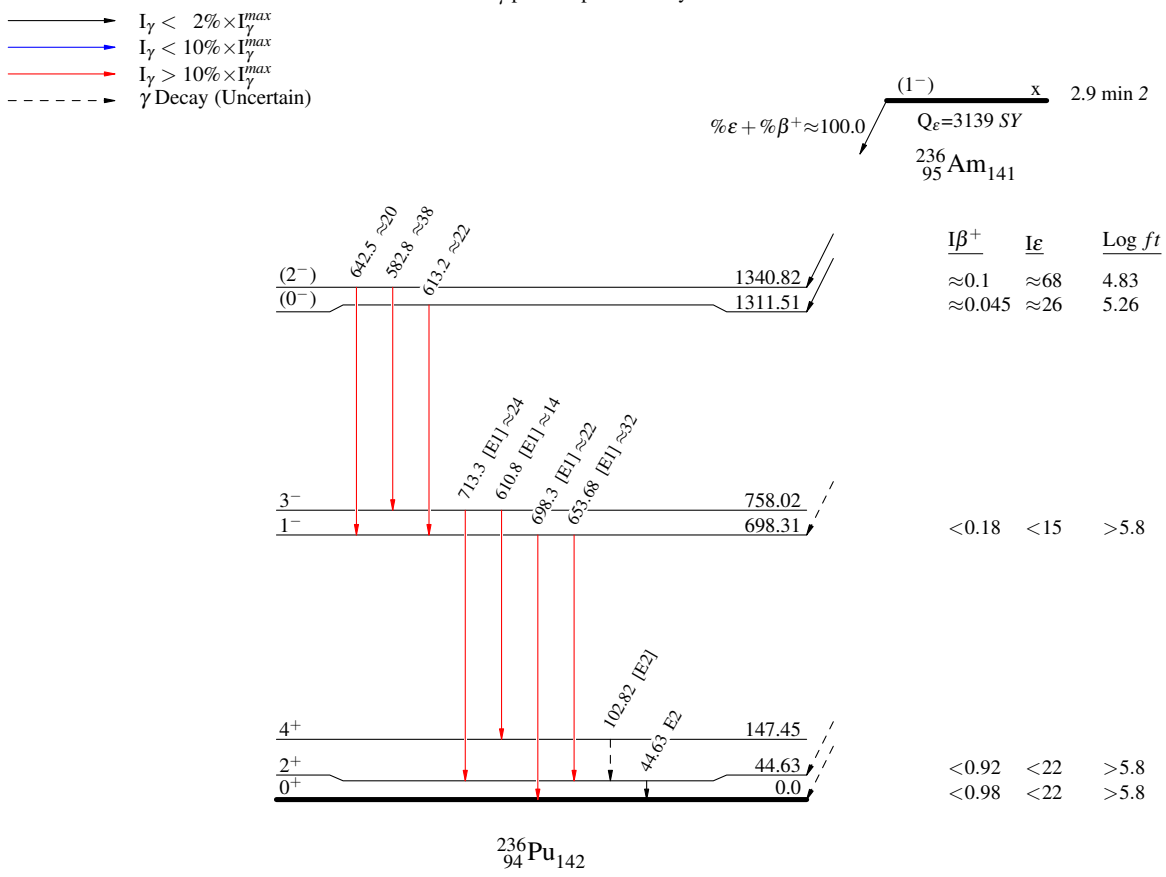
### Decay Scheme

Intensities: $I_\gamma$ per 100 parent decays



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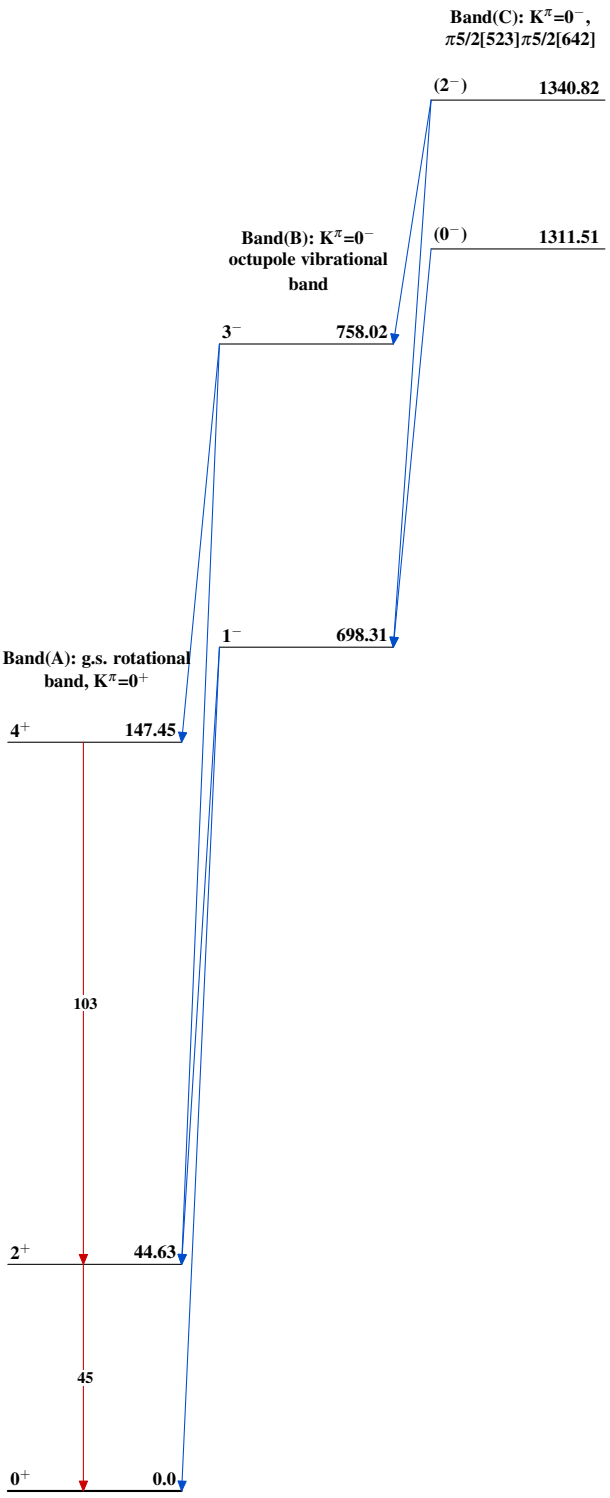


$^{236}_{94}Pu_{142}$