## $^{253}$Fm ε decay 1967Ah02

History

| Type | Author | Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | E. Browne, J. K. Tuli | NDS 114, 1041 (2013) | 1-Mar-2012 |

Parent: $^{253}$Fm: E=0.0; $J^\pi=(1/2)^+$; $T_{1/2}$=3.00 d *12*; Q(ε)=336 *3*; %ε decay=88 *1*

1967Ah02: $^{252}$Cf(α,3n)$^{253}$Fm: E=40 MeV, ion chem. Measured α, γ, ce, K x ray(Es), αγ.

$T_{1/2}$ and Q($\beta^-$) require that ε decay goes to a level with J=1/2 or 3/2. From Nilsson model, one expects configuration=3/2[521] and 1/2[521]. No direct decay to $7/2^+$ g.s. is expected (third forbidden log *ft*>12.8).

Looked for (ce)(K x ray) prompt coincidences; only prompt ce line (with E>50) observed was the ce(K) of 272γ of $^{249}$Cf (α decay daughter) (1967Ah02). An M2 transition of this energy would be expected to have $T_{1/2}$>1 μs.

K x ray(Es)/272γ($^{249}$Cf)=17.3 *10* (1967Ah02), which gives K x ray(Es)=0.51 *9* per $^{253}$Fm ε decay (if I(272γ)=0.22 per $^{253}$Fm α decay (A=249 Nuclear Data Sheets, 1999Ar21)). From the proposed decay scheme I(K x ray)=0.374 *18* from K-shell electron capture.

### $^{253}$Es Levels

| E(level) | $J^\pi$ | $T_{1/2}$ | Comments |
|---|---|---|---|
| 0.0 | $7/2^+$ | 20.47 d *3* | S,$T_{1/2}$: From Adopted Levels. |