Adopted Levels

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Khalifeh Abusaleem	NDS 116, 163 (2014)	31-Dec-2012

Q(β^-)=4426 *14*; S(n)=4388 *19*; S(p)=6806 *20*; Q(α)=3233 *26* 2012Wa38
Assignment: Th(660 MeV p) ms (1975Ra03); ^{238}U(660 MeV p) ms (1982Ru04).
Searched for β^- delayed fission, not found (probability<2×10^{-7}) (1990Me13).
Systematics: Level structure in odd-odd actinides (1994So16).

Mass measurement: 2010Li02.
Production cross section: 2010Al24, 2009Pa49, 2004Pe17.
Isomeric state at around 500 keV and half-life of around 1 minute (2006Li59).
Calculation of isotopic shift: 2005Dz02.
No level scheme has been proposed. For γ's observed in 65 s ^{228}Rn β^- decay, see ^{228}Rn β^- decay data set.

^{228}Fr Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	2^- †	38 s *1*	%$\beta^-\le$100 μ=−0.76 *2* (1989Ra17,1985Co24); Q=+2.38 *5* (1989Ra17,1985Co24) J^π: J from atomic beam laser spect (1985Co24). π=− from log *ft*=7.3 (log $f^{1u}t$=8.9) to 4^+ level in ^{228}Ra. $T_{1/2}$: from 1982Ru04; others: 36 s *2* (1989Bo11), 39 s *1* (1975Ra03). %β^-: Only β^- decay has been observed; %$\beta^-\approx$40 from gross β^- decay strength function (1973Ta30). The other 60% decay should be α. Theoretical half lives (1997Mo25) for β and α decay exclude α-decay mode ($T_{1/2}(\alpha)>\times10^{20}$ s). Isotope shift: $\Delta\langle r^2\rangle$=+1.67522 *20* relative to ^{212}Fr (1987Co19) (correction of earlier value quoted in 1985Co24).

† For a discussion of deformation and configuration, see 1988Sh01 and 1986Ek02. 1988Sh01 deduce that 2^- is a possible assignment for an octupole deformed ^{228}Fr; 1986Ek02 deduce from nuclear moments that the main configuration=((π 1/2[400])(ν 5/2[633])).