^{213}Fr ε decay (34.17 s) 2016Pr08

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 181, 475 (2022)	1-Jan-2022

Parent: ^{213}Fr: E=0.0; $J^\pi=9/2^-$; $T_{1/2}$=34.17 s *6*; Q(ε)=2142 *6*; %ε+%$β^+$ decay=0.56 *5*

^{213}Fr-Q(ε): From 2021Wa16: AME-2020.

Adapted/Edited the XUNDL dataset compiled by B. Singh (McMaster) Jan 6, 2017.

2016Pr08: ^{213}Fr produced in U(p,X), E(p)=1.4 GeV pulsed beam at ISOLDE-CERN facility using UC_x target and general purpose separator (GPS). Measured Eγ, Iγ, (x ray)γ- and γγ-coin using two HPGe detectors, and conversion electrons using a Mini-Orange magnetic spectrometer and a Si(Li) detector. Deduced levels, ε feedings, and log *ft* values. Shell-model calculations.

^{213}Rn Levels

E(level)†	J^π‡	$T_{1/2}$‡
0.0	$(9/2^+)$	19.4 ms *2*
704.3 *5*	$(11/2^+)$	
1347.0 *5*		
1352.7 *5*		
1785.0 *5*		
1834.1 *5*		

† From Eγ data.
‡ From Adopted Levels.

γ(^{213}Rn)

Iγ normalization: Ground state (g.s.) feeding is expected and not known and so not normalized. If no g.s. ε feeding is assumed, normalization factor is 0.603 *11*. 2016Pr08 estimates ε feeding to the g.s. of 5% or 30% corresponding to log *ft* 7.4 or 6.6, respectively, based on the log *ft* value systematics for first forbidden transitions.

E_γ†	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α‡	Comments
438.0 *5*	2.6 *3*	1785.0		1347.0				
704.3 *5*	100	704.3	$(11/2^+)$	0.0	$(9/2^+)$	M1	0.0606	α(K)exp=0.0502 *59*; α(L)exp=0.0097 *13*; α(M)exp=0.0023 *3* (2016Pr08) α(K)=0.0493 *7*; α(L)=0.00863 *13*; α(M)=0.00204 *3* α(N)=0.000531 *8*; α(O)=0.0001164 *17*; α(P)=1.702×10^{-5} *24* Mult.: from α(K)exp, α(L)exp and α(M)exp measurements (2016Pr08). δ: The subshell α(exp) values yield δ=0.00 *12* using the BriccMixing code.
1080.7 *5*	3.1 *5*	1785.0		704.3	$(11/2^+)$			
1129.8# *5*		1834.1		704.3	$(11/2^+)$			Weak γ ray. Uncertain placement, not adopted.
1347.0 *5*	16.4 *14*	1347.0		0.0	$(9/2^+)$			
1352.7 *5*	22.7 *19*	1352.7		0.0	$(9/2^+)$			
1785.0 *5*	16.4 *14*	1785.0		0.0	$(9/2^+)$			
1834.1 *5*	4.3 *5*	1834.1		0.0	$(9/2^+)$			

† Uncertainty in Eγ is stated by 2016Pr08 as within 0.5 keV and 0.5 keV has been assigned for each Eγ by the evaluator.
‡ Additional information 1.
# Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: Relative I_γ