^{139}Nd IT decay (5.50 h) 1971Bu22

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	P. K. Joshi, B. Singh, S. Singh, A. K. Jain	NDS 138, 1 (2016)	15-Oct-2016

Parent: ^{139}Nd: E=231.15 *5*; $J^\pi=11/2^-$; $T_{1/2}$=5.50 h *20*; %IT decay=13.0 *10*

^{139}Nd-%IT decay: From I(γ+ce)(231γ in IT decay)+ΣI(γ+ce)(to 113.9 level)+ ΣI(γ+ce)(822.1γ+827.8γ+852γ)=100. It is assumed that there is no direct $\varepsilon+\beta^+$ feeding to the g.s. and the 113.87 level. Value of I(γ+ce) for 231γ (in ^{139}Nd IT decay) is deduced in two ways: 1. from measured Iγ(231γ)=2.35 *20* (average of values from 1971Bu22 and 1969Be64); 2. from I(ceK) data for 231γ, Iγ and I(ceK) data for five strong γ rays (1971Bu22) in ^{139}Pr were used to determine an average conversion factor of 43.1 *25* to normalize the ce(K) and Iγ data in 1971Bu22 on the same scale, which is then used to obtain I(γ+ce) for 231γ. Values of branching ratios are: 87.2% *11* using measured Iγ of 231γ and 86.6% *15* from measured I(ceK) value of 231γ. Weighted average of the two results is 87.0% *10* for %($\varepsilon+\beta^+$), and 13.0 *10* for IT decay. Other: 14.3% *14* (1971Bu22) from comparison of ce(K)(165.84γ; ^{139}Ce) to ce(K)(231.15γ).

Measured: Eγ, Iγ, and ce; ms, chem. See also ^{139}Nd ε decay (5.5 h).

^{139}Nd Levels

E(level)	J^π†	$T_{1/2}$†	Comments
0.0	$3/2^+$		%ε+%β^+=100
231.15 *5*	$11/2^-$	5.50 h *20*	%ε+%β^+=87.0 *10*; %IT=13.0 *10*

† From the Adopted Levels.

γ(^{139}Nd)

E_γ	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α‡	$I_{(\gamma+ce)}$†	Comments
231.15 *5*	6.45 *CA*	231.15	$11/2^-$	0.0	$3/2^+$	M4	14.51	100	ce(K)/(γ+ce)=0.605 *7*; ce(L)/(γ+ce)=0.254 *5*; ce(M)/(γ+ce)=0.0608 *12* ce(N)/(γ+ce)=0.0136 *3*; ce(O)/(γ+ce)=0.00189 *4*; ce(P)/(γ+ce)=7.60×10^{-5} *15* α(K)=9.38 *14*; α(L)=3.95 *6*; α(M)=0.943 *14*; α(N)=0.211 *3*; α(O)=0.0293 *5*; α(P)=0.001179 *17* I_γ: from I(γ+ce) and α. Other: measured Iγ=2.3 *2* (1971Bu22) relative to 100 for 738.2γ in ^{139}Pr from 5.5-h ^{139}Nd decay. K:L12:L3:M:N+=1000:251 *21*:141 *17*:96 *16*:29 *4* (1971Bu22). Mult.: from K:L12:L3.

† For absolute intensity per 100 decays, multiply by 0.130 *10*.

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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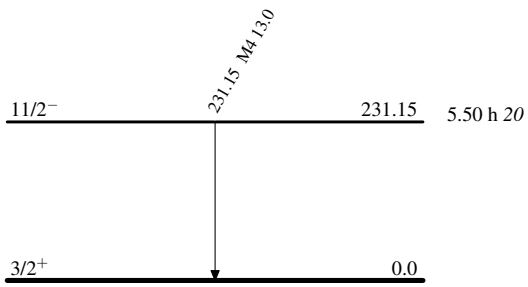
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
%IT=13.0 *10*



$^{139}_{60}Nd_{79}$