^{143}Pr β^- decay 1972Gr21

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 113, 715 (2012)	31-May-2011

Parent: ^{143}Pr: E=0.0; $J^\pi=7/2^+$; $T_{1/2}$=13.57 d *2*; Q(β^-)=934.1 *14*; %β^- decay=100.0

^{143}Pr-$T_{1/2}$: 13.564 d *13*, from limitation of relative statistical weight analysis: 13.59 d *4* (1957Pe09), 13.59 d *10* (1963Ho15), 13.55 d *2* (1965Is03), 13.57 d *2* (1971Ba28); other: 13.76 d *5* (1957Wr37), not included in the mean.

^{143}Pr-Q(β^-): from 2011AuZZ.

^{143}Pr production: ^{142}Ce(n,γ)^{143}Ce(β^- decay), fission product.

Measured: β shape (1977Ra26,1974RaYS,1973RaWX,1971Fi02,1966Sp06,1965Pe07,1958Ha29); internal bremsstrahlung (1977Na21,1969Be52,1957St05).

The decay scheme is from 1972Gr21.

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Atomic Data for Nd (Z=60) (1996Sc06):
            K-shell fluorescence yield ωK=0.918    4
            L-shell fluorescence yield (mean) ωL=0.140    6
            Prob. of creating L vacancy by filling K vacancy,
                                        ηkl=0.866     4
     Electron binding energies (keV) (1967Be73):
            K-shell =43.5689 4
            L1-shell=7.1260 4
            M1-shell=1.5753 7
            N1-shell=0.3152 8
     X-ray Energies (keV) (1999ScZX)
            E(Nd Kα1      x ray)=37.3614 2
            E(Nd Kα2      x ray)=36.8478 3
            E(Nd Kβ   x ray)=42.467
            E(Nd L  x ray)=4.63-7.11 (several lines)
     Auger Energies (1967Be73):
            K Auger energy=4.23
            L Auger energy=30.5
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^{143}Nd Levels

E(level)	J^π[†]
0.0	$7/2^-$
742.10 *8*	$3/2^-$

[†] From Adopted Levels.

β^- radiations

K-shell internal ionization probability per 100 β^- decay=0.0291 *12*, weighted average of 0.0292 *16* (1976Ha30), 0.0295 *32* (1971Fi02), and 0.0288 *20* (1973Va22). Other: 1957St05. Calculated values: 1977Is05, 1975La20,1972Mo26, 1972La07.

L-shell internal ionization probability per 100 β^- decay=0.019 *2* (1960Su14). Calculated values: 1982Ch19, 1972La09.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(192.0 *14*)	742.10	1.2×10^{-6} *4*	12.7[1u]	av Eβ=62.07 *59*
934.1 *14*	0.0	100	7.6	av Eβ=315.08 *56* E(decay): from 2011AuZZ. Measured: Eβ=932 *2* (1949Fe18), 935 *2* (1976Ra33). Others: 920 *10* (1949Te12), 915 *15* (1952Ko27), 930 *10* (1956Ma16), 933 *5* (1958Ha29), 930 *2* (1965Sl02). av Eβ=310 *+20−4* (1964Ho27).

[†] Absolute intensity per 100 decays.

^{143}Pr β^- decay 1972Gr21 (continued)

$\gamma(^{143}Nd)$

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[‡]	Comments
742.10 *8*	1.2×10^{-6} *4*	742.10	3/2$^-$	0.0	7/2$^-$	E2	0.00436 *7*	α=0.00436 *7*; α(K)=0.00368 *6*; α(L)=0.000536 *8*; α(M)=0.0001143 *16*; α(N+..)=2.95×10^{-5} *5* α(N)=2.55×10^{-5} *4*; α(O)=3.79×10^{-6} *6*; α(P)=2.21×10^{-7} *3* E_γ: from limitation of relative statistical weight (LWM) analysis of measured values: ^{143}Pm ε decay: Eγ=741.98 *4* (1971ScZU), 742.9 *2* (1970Av03), 741.8 *15* (1960Fu05); (α,nγ): 742.1 *3* (1983WrZY,1985ClZY), 742.1 *1* (1990Wr01); (α,3nγ): 741.8 *2* (1977Ha04); (n,γ): 742.09 *10* (1976Mi19); Others: ^{143}Pr β^- decay: 742 (1972Gr21); Coul. ex.: 741.2 (1984Dr03). I_γ: from 1972Gr21. Others: ≤1.5×10^{-4}% (1963Gr10), <1×10^{-3}% (1955Sa05); 1971Fi02 did not detect this transition. Mult.: from ce(K)=0.0035 *4* in ^{143}Pm ε decay (1970Av03). Other: 1968Be39.

[†] Absolute intensity per 100 decays.

[‡] 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_γ per 100 parent decays