^{144}Nd(p,2nγ) 1981Ko16

History

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

E=15.8-20.4 MeV; Iγ at E(p)=20.2 MeV.
Measured: γ rays, $\gamma\gamma$ coin., $\gamma(\theta)$, ce, γ(t).

^{143}Pm Levels

E(level)	J$^\pi$†	$T_{1/2}$	E(level)	J$^\pi$†	$T_{1/2}$	E(level)	J$^\pi$†
0.0	$5/2^+$		1566.0 *4*	$(9/2)^+$		2007.8	
272.10 *5*	$7/2^+$		1614.1 *4*	$5/2^+$,$3/2^+$		2060.3	$13/2^-$
959.8 *2*	$11/2^-$	24.0 ns *10*	1663.5 *4*	$11/2^+$		2108.3 *7*	
1056.5 *3*	$3/2^+$		1816.4 *6*			2232.5 *7*	
1173.1 *3*	$1/2^+$		1824.3 *4*			2287.5 *6*	$17/2^+$
1402.5 *4*	$3/2^+$		1853.9 *4*			2437.2 *5*	$15/2^-$
1456.4 *4*	$9/2^+$		1898.4 *5*	$15/2^+$	10.3 ns *5*	2881.6 *6*	$17/2^-$
1515.0 *4*	$3/2^+$,$5/2^+$		1950.8 *5*	$13/2^-$		2929.9 *7*	$19/2^-$
1558.5 *4*	$(^+)$		1969.6 *6*			3013.3 *8*	$21/2^-$

† From Adopted Levels.

$\gamma(^{143}Pm)$

α(K)exp were normalized to α(K) for 618γ E2 in ^{144}Nd(p,p′).

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	δ	$\alpha^\dagger$	Comments
83.41 *8*	1.9 *10*	3013.3	21/2$^-$	2929.9	19/2$^-$				
x104.70 *7*	2.4 *10*								
x145.55 *9*	4.5 *10*								
x154.0 *1*	1.9 *10*								
x193.4 *1*	3.5 *10*								
234.93 *6*	130 *10*	1898.4	15/2$^+$	1663.5	11/2$^+$	E2		0.1186	B(E2)(W.u.)=1.54 *8* α(K)=0.0896 *13*; α(L)=0.0227 *4*; α(M)=0.00506 *7*; α(N+..)=0.001271 *18* Mult.: α(K)exp=0.086 *9*.
272.10 *5*	1000	272.10	7/2$^+$	0.0	5/2$^+$	M1(+E2)	<0.15	0.0961	α(K)=0.0818 *12*; α(L)=0.01131 *16*; α(M)=0.00241 *4*; α(N+..)=0.000631 *9* Mult.: α(K)exp=0.075 *8*; A$_2$=−0.016 *6*, A$_4$=−0.013 *9*.
287.32 *6*	33 *5*	1950.8	13/2$^-$	1663.5	11/2$^+$	E1		0.01577	α(K)=0.01347 *19*; α(L)=0.00181 *3*; α(M)=0.000385 *6*; α(N+..)=9.96×10^{-5} *14* Mult.: α(K)exp=0.022 *3*; A$_2$=−0.21 *2*, A$_4$≈0.
x296.0 *1*	5.6 *10*								
x357.4 *1*	4.8 *6*								
376.54 *10*	27 *5*	2437.2	15/2$^-$	2060.3	13/2$^-$				Mult.: E1 from α(K)exp=0.011 *5*; A$_2$=−0.21 *3*, A$_4$≈0. E1 is in conflict with adopted J^π. Placement from Adopted Levels. Placement from 1898.4 level was suggested earlier.
389.10 *12*	45 *5*	2287.5	17/2$^+$	1898.4	15/2$^+$	M1(+E2)		0.031 *7*	α(K)=0.026 *6*; α(L)=0.0040 *4*; α(M)=0.00087 *6*; α(N+..)=0.000226 *18* Mult.: α(K)exp=0.022 *5*; A$_2$=−0.21 *3*, A$_4$≈0,
396.85 *12*	25 *5*	2060.3	13/2$^-$	1663.5	11/2$^+$	E1		0.00707 *10*	α=0.00707 *10*; α(K)=0.00606 *9*; α(L)=0.000804 *12*; α(M)=0.0001703 *24*; α(N+..)=4.42×10^{-5} *7* Mult.: α(K)exp=0.006 *2*; A$_2$=−0.14 *2*, A$_4$=−0.05 *4*.
x494.1 *2*	19 *5*					(E2+M1)		0.017 *4*	α(K)=0.014 *4*; α(L)=0.0021 *3*; α(M)=0.00044 *6*; α(N+..)=0.000115 *17* Mult.: α(K)exp=0.013 *4*, α(K)=0.01047 (E2), α(K)=0.01770 (M1).
x518.3 *2*	13 *4*								
642.4 *2*	23 *5*	2929.9	19/2$^-$	2287.5	17/2$^+$	E1		0.00238 *4*	α=0.00238 *4*; α(K)=0.00204 *3*; α(L)=0.000265 *4*; α(M)=5.61×10^{-5} *8*; α(N+..)=1.461×10^{-5} *21* Mult.: α(K)exp<0.004; A$_2$=−0.16 *3*, A$_4$≈0.
x687.2 *4*	40 *15*								
687.7 *4*	310 *50*	959.8	11/2$^-$	272.10	7/2$^+$	M2		0.0253	B(M2)(W.u.)=0.25 *6* α(K)=0.0213 *3*; α(L)=0.00313 *5*; α(M)=0.000673 *10*; α(N+..)=0.0001762 *25* α(N)=0.0001519 *22*; α(O)=2.29×10^{-5} *4*; α(P)=1.439×10^{-6} *21* Mult.: α(K)exp=0.018 *5*.

$^{143}_{61}Pm_{82}$-2

^{144}Nd(p,2nγ) 1981Ko16 (continued)

γ(^{143}Pm) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α†	Comments
767.8 *2*	18 *4*	1824.3		1056.5	3/2+			
797.4 *2*	10 *3*	1853.9		1056.5	3/2+			
959.8 *2*	70 *10*	959.8	11/2−	0.0	5/2+	E3	0.00557 *8*	B(E3)(W.u.)=10.0 *21* α=0.00557 *8*; α(K)=0.00461 *7*; α(L)=0.000756 *11*; α(M)=0.0001642 *23*; α(N+..)=4.25×10^{-5} *6* Mult.: α(K)exp=0.0030 *15*; A_2=+0.04 *2*, A_4=−0.03 *3*.
983.2 *2*	20 *6*	2881.6	17/2−	1898.4	15/2+			Mult.: A_2=+0.12 *1*, A_4=+0.02 *2*; not compatible with γ(θ) and linear polarization data from (α,2nγ)(1980Pr02).
991.1 *2*	9 *3*	1950.8	13/2−	959.8	11/2−			
1056.5 *3*	110 *15*	1056.5	3/2+	0.0	5/2+	E2+(M1)	0.0027 *6*	α=0.0027 *6*; α(K)=0.0023 *5*; α(L)=0.00030 *6*; α(M)=6.5×10^{-5} *12*; α(N+..)=1.7×10^{-5} *4* Mult.: α(K)exp=0.0012 *6* (A_2=−0.05 *1*, A_4=−0.03 *1*), α(K)=0.00179 (E2), α(K)=0.00280 (M1).
1173.1 *3*	21 *5*	1173.1	1/2+	0.0	5/2+			
1184.3 *3*	12 *3*	1456.4	9/2+	272.10	7/2+			
1242.7 *3*	10 *2*	1515.0	3/2+,5/2+	272.10	7/2+			
x1278.4 *3*	16 *3*							
1286.4 *3*	40 *8*	1558.5	(+)	272.10	7/2+	(E2)	0.001427 *20*	α=0.001427 *20*; α(K)=0.001204 *17*; α(L)=0.0001617 *23*; α(M)=3.43×10^{-5} *5*; α(N+..)=2.72×10^{-5} α(N)=7.73×10^{-6} *11*; α(O)=1.161×10^{-6} *17*; α(P)=7.24×10^{-8} *11*; α(IPF)=1.82×10^{-5} *3* Mult.: α(K)exp=0.0009 *2*.
1293.9 *3*	68 *10*	1566.0	(9/2)+	272.10	7/2+	(M1+E2)	0.0017 *3*	α=0.0017 *3*; α(K)=0.0015 *3*; α(L)=0.00019 *4*; α(M)=4.1×10^{-5} *7*; α(N+..)=3.07×10^{-5} *24* Mult.: α(K)exp=0.0007 *2*; A_2=−0.24 *2*, A_4=−0.03 *4*; mult is compatible with adopted decay scheme (J^π and Branching).
1342.0 *3*	30	1614.1	5/2+,3/2+	272.10	7/2+			
1391.4 *3*	260 *50*	1663.5	11/2+	272.10	7/2+	E2	0.001249 *18*	α=0.001249 *18*; α(K)=0.001033 *15*; α(L)=0.0001375 *20*; α(M)=2.92×10^{-5} *4*; α(N+..)=4.97×10^{-5} Mult.: α(K)exp=0.0009 *2*; A_2=+0.20 *1*, A_4=−0.05 *2*.
1402.5 *4*	30 *5*	1402.5	3/2+	0.0	5/2+	E2+(M1)	0.00147 *24*	α=0.00147 *24*; α(K)=0.00122 *21*; α(L)=0.00016 *3*; α(M)=3.4×10^{-5} *6*; α(N+..)=5.6×10^{-5} *3* Mult.: α(K)exp=0.0008 *2*, α(K)=0.00102 (E2), α(K)=0.00145 (M1).
1456.4 *4*	115 *5*	1456.4	9/2+	0.0	5/2+	E2	0.001166 *17*	α=0.001166 *17*; α(K)=0.000946 *14*; α(L)=0.0001253 *18*; α(M)=2.66×10^{-5} *4*; α(N+..)=6.84×10^{-5} Mult.: α(K)exp=0.0006 *2*; A_2=+0.22 *1*, A_4=−0.03 *2*.
1477.4 *4*	32 *8*	2437.2	15/2−	959.8	11/2−	E2	0.001143 *16*	α=0.001143 *16*; α(K)=0.000920 *13*; α(L)=0.0001217 *17*; α(M)=2.58×10^{-5} *4*; α(N+..)=7.50×10^{-5} Mult.: α(K)exp=0.0009 *2*; A_2=+0.39 *4*, A_4≈0.
1515.0 *4*	25 *7*	1515.0	3/2+,5/2+	0.0	5/2+	M1+E2	0.00129 *19*	α=0.00129 *19*; α(K)=0.00104 *17*; α(L)=0.000136 *21*; α(M)=2.9×10^{-5} *5*; α(N+..)=9.1×10^{-5} *5* Mult.: α(K)exp=0.0010 *3*.
x1527.4 *5*	15 *5*							

$^{143}_{61}Pm_{82}$-3

^{144}Nd(p,2nγ) 1981Ko16 (continued)

γ(^{143}Pm) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α†	Comments
1544.3 *5*	18 *6*	1816.4		272.10	7/2$^+$			
1566.0 *5*	28 *6*	1566.0	(9/2)$^+$	0.0	5/2$^+$	(E2)	0.001061 *15*	α=0.001061 *15*; α(K)=0.000824 *12*; α(L)=0.0001084 *16*; α(M)=2.30×10^{-5} *4*; α(N+..)=0.000105 Mult.: α(K)exp=0.0010 *3*.
[x]1667.4 *5*	20 *5*							
1697.5 *5*	32 *6*	1969.6		272.10	7/2$^+$			
1735.7 *6*	30 *8*	2007.8		272.10	7/2$^+$			
1824.8 *6*	40 *8*	1824.3		0.0	5/2$^+$			
1836.2 *6*	50 *10*	2108.3		272.10	7/2$^+$			
1960.4 *6*	35 *10*	2232.5		272.10	7/2$^+$			
[x]1977.6 *6*	38 *10*							

† Additional information 1.
[x] γ ray not placed in level scheme.

$^{143}_{61}Pm_{82}$-4

^{144}Nd(p,2nγ) 1981Ko16

Level Scheme

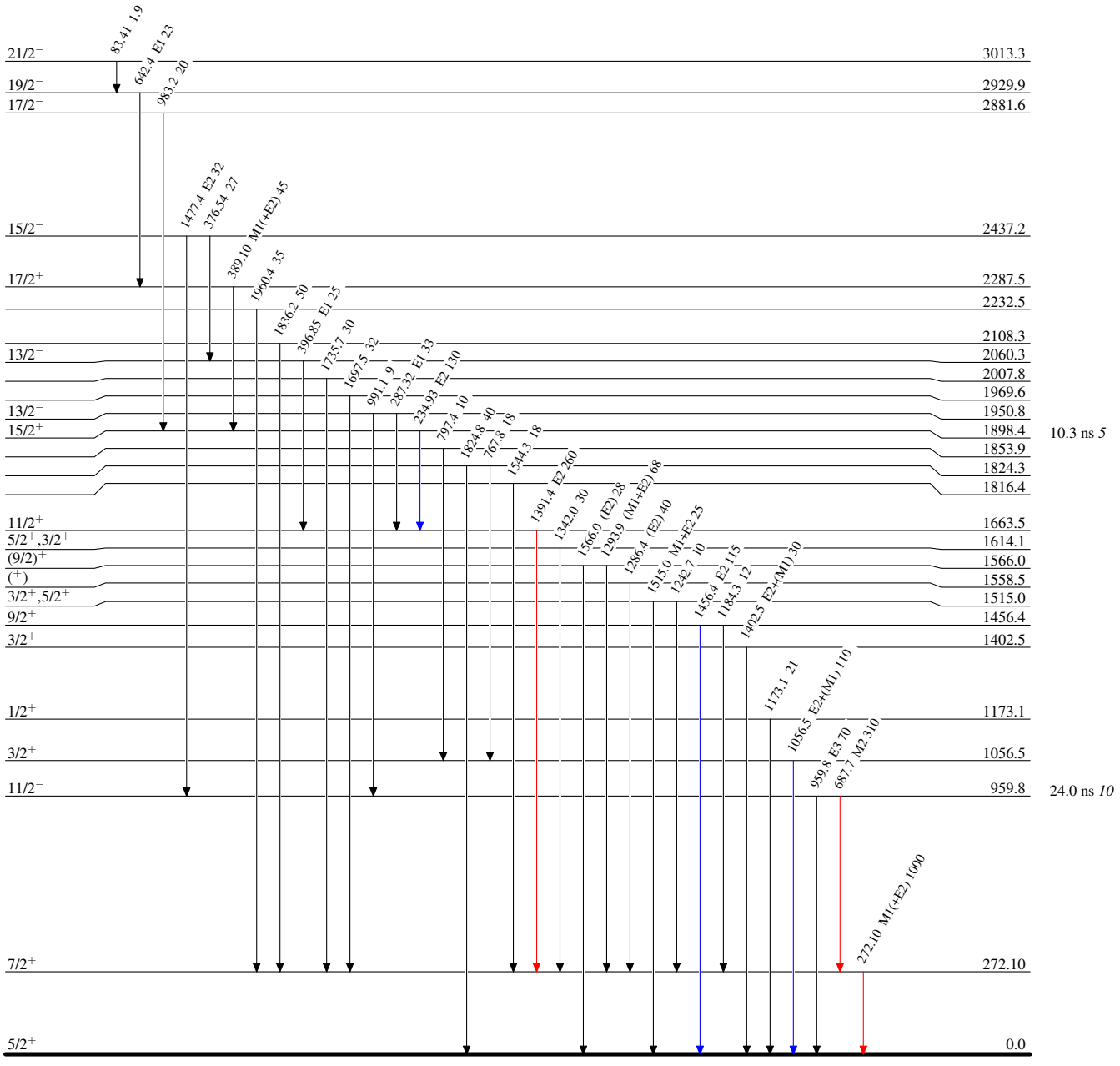
Intensities: Type not specified

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{143}_{61}Pm_{82}$