Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 176, 1 (2021)	1-May-2021

Q(β^-)=6170 *50*; S(n)=5070 *60*; S(p)=13240 *SY*; Q(α)=−4330 *SY* 2021Wa16
ΔS(p)=400, ΔQ(α)=300 (syst,2021Wa16).
S(2n)=9030 *50*, S(2p)=24760 *400* (syst), Q(β^-n)=1760 *50* (2021Wa16).
2012Ku26: ^{160}Nd produced and identified in ^{9}Be(^{238}U,F), E=1 GeV/nucleon reaction using SIS-18 synchrotron facility at GSI. Target=1.6 g/cm^2 ^{9}Be placed at the entrance of projectile Fragment Separator (FRS). Particle identification was achieved by event-by-event in-flight analysis of time-of-flight, energy loss measurement, and magnetic rigidity (tof-ΔE′-Bρ). Time-of-flight measured using two plastic scintillation detectors, energy loss or deposit by ionization chambers (MUSIC), and magnetic rigidity by four time-projection chambers (TPC), which also provided energy deposit information. Isomer tagging method for known μs isomers was used to verify event-by-event identification and in-flight separation of new isotopes. Gamma rays from the known isomers were recorded in coincidence with the incoming ions using either the RISING array of Ge detectors at GSI or only two Ge detectors, a stopper foil and a scintillator for veto signal. Measured production cross section. Comparison of measured σ with predictions from ABRABLA model and EPAX-3 model.
2012Au07 (NUBASE-12) quote first observation of ^{160}Nd in 1985Si25 (and priv. comm. from the first author of 1985Si25 to G. Audi in January 1988) from thermal fission of ^{252}Cf. The perusal of 1985Si25 does not show any indication of identification of ^{160}Nd isotope, and private communication is only an oral one, thus there does not seem much evidence of identification of ^{160}Nd in 1985 paper.
2017Wu04, 2016Id02, 2015TaZX: ^{9}Be(^{238}U,F), E=345 MeV/nucleon, see ^{160}Nd IT Decay dataset.
Nuclear structure calculations (levels, J, π, moments): 2012Gh07, 1997Lo07, 1987Ne03, 1985Ro21, 1984Sa16.
Unless mentioned otherwise, all data are from 2016Id02 (^{160}Nd IT Decay dataset).

^{160}Nd Levels

Cross Reference (XREF) Flags

A ^{160}Nd IT decay

E(level)†	J$^\pi$@	T$_{1/2}$	XREF	Comments
0.0‡	0$^+$	439 ms *37*	A	%β^-=100; %β^-n=? Mainly β^- decay mode is expected. E(level): the observed ^{160}Nd fragments assumed to correspond to the g.s. T$_{1/2}$: from 2017Wu04 (fit of the time distribution of electrons detected after the implantation of an ion, correlated to them in position and time employing the least-squared and unbinned maximum likelihood methods in a parallel analysis that included contributions from the methods in decays of parent, daughters, granddaughters, as well as a constant background) and 0.54 s from theoretical calculations (2019Mo01). Production σ=9.5 nb *22* (2012Ku26) (at 1 GeV/nucleon).
65.2‡ *5*	(2$^+$)		A	
215.1‡ *7*	(4$^+$)		A	
1107.9# *9*	(4$^-$)	1.63 μs *21*	A	configuration: ν1/2[521] ⊗ ν7/2[633] (2016Id02, projected shell-model and deformed Hartree-Fock calculations). J$^\pi$: based on coin relations and decay pattern; K^π=(4$^-$) (2016Id02, 2015TaZX). The only two quasiparticle states predicted below 1.5 MeV have spins 4$^-$ and 7$^-$; 4$^-$ more likely based on configuration and predicted energy 1.07 MeV in agreement with the observed energy. T$_{1/2}$: from γ(t) (2016Id02, 2015TaZX).

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{160}Nd Levels (continued)

† From Eγ values.
‡ Band(A): $K^{\pi}=0^{+}$ ground-state band.
# Band(B): $K^{\pi}=(4^{-})$ $\nu 1/2[521] \otimes \nu 7/2[633]$ bandhead.
@ Postulated by 2016Id02 based on analogy with ^{156}Nd (2009Si21) and the expected rotational character of these nuclei.

γ(^{160}Nd)

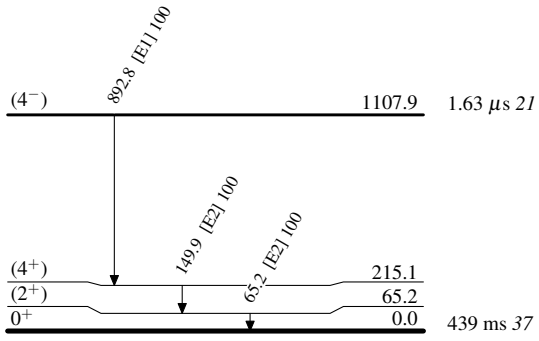
E_i(level)	J_i^{π}	E_γ†	I_γ†	E_f	J_f^{π}	Mult.	α‡	Comments
65.2	(2^+)	65.2 *5*	100	0.0	0^+	[E2]	10.7 *4*	α(K)=3.53 *8*; α(L)=5.55 *22*; α(M)=1.27 *5* α(N)=0.274 *11*; α(O)=0.0346 *14*; α(P)=0.000152 *4*
215.1	(4^+)	149.9 *5*	100	65.2	(2^+)	[E2]	0.524 *10*	α(K)=0.358 *7*; α(L)=0.130 *3*; α(M)=0.0293 *6* α(N)=0.00637 *13*; α(O)=0.000846 *17*; α(P)=1.71×10^{-5} *3*
1107.9	(4^-)	892.8 *5*	100	215.1	(4^+)	[E1]	1.16×10^{-3}	α(K)=0.001000 *14*; α(L)=0.0001271 *18*; α(M)=2.67×10^{-5} *4* α(N)=5.96×10^{-6} *9*; α(O)=9.05×10^{-7} *13*; α(P)=5.91×10^{-8} *9* B(E1)(W.u.)=2.0×10^{-10} *3* Reduced hindrance f_ν=1717 *74* for ν=3 (by the evaluator). Additional information 1.

† From 2016Id02 in ^{160}Nd IT decay dataset.
‡ Additional information 2.

Adopted Levels, Gammas

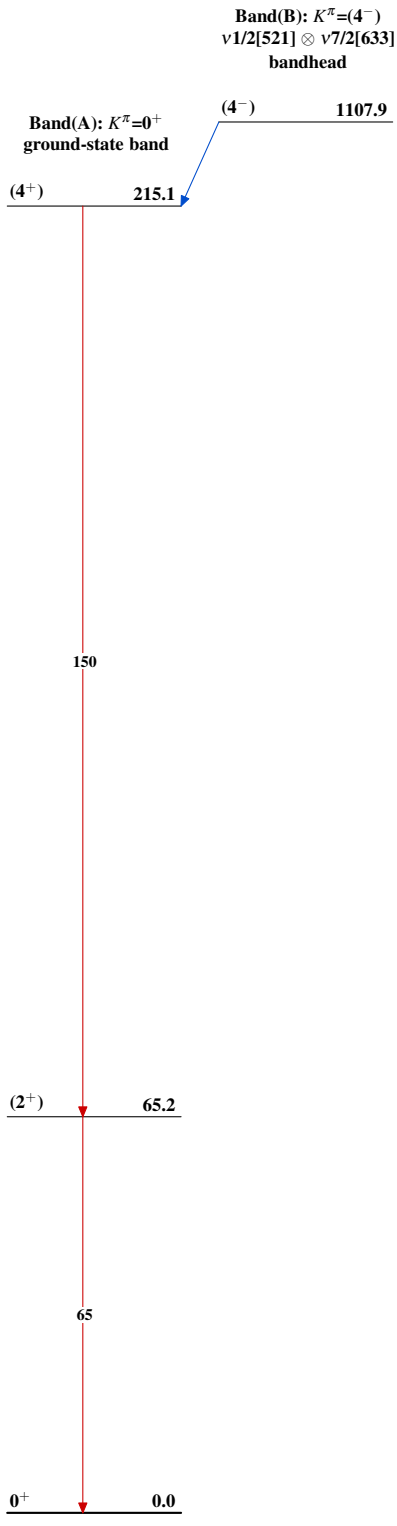
Level Scheme

Intensities: Relative photon branching from each level



$^{160}_{60}Nd_{100}$

Adopted Levels, Gammas



$^{160}_{60}Nd_{100}$