BERKELEY LAB

LAWRENCE BERKELEY NATIONAL LABORATORY

U.S. DEPARTMENT OF ENERGY

Source Reference:

^{229}Th half-life from NuDAT and other items for discussion

M. Shamsuzzoha Basunia

USNDP meeting, BNL, 13-15 Nov, 2023

^{229}Th half-life from NuDAT

One of our group members was looking for it:

$T_{1/2}$ = 7932 y (28)

Source is missing

Ground and isomeric state information for $^{229}_{90}$Th

E(level) (MeV)	Jn	Mass Excess (keV)	$T_{1/2}$	Decay Modes
0.0	5/2+	29585.5 *24*	7932 y *28*	α = 100.00%
0.0000082	(3/2+)	29585.5 *24*	7 μs *1*	IT = 100.00%

The following are available

List of levels | Interactive Level Scheme (Beta) | Level Scheme | J vs. E* plot | J vs. E(γ) plot | E(γ)/J plot | Band parameters | Decay radiation information

$T_{1/2}$ = 7880 y (120)

$T_{1/2}$ = 7340 y (160)

^{229}Th half-life (NuDAT) – list of levels

ADOPTED LEVELS, GAMMAS for ^{229}Th

Authors: E. Browne, J. K. Tuli | Citation: Nucl. Data Sheets 109, 2657 (2008) | Cutoff date: 1-Jun-2008

Full ENSDF file | Adopted Levels (PDF version)

Q(β-)=-312 keV 4 S(n)= 5257 keV 3 S(p)= 6599 keV 3 Q(α)= 5167.6 keV 11

Reference: 2012WA38

XREFs ☑ J^{π} ☑ $T_{1/2}$/Decay ☑ E(γ) ☑

E(level) (keV)	XREF	J^{π}(level)	$T_{1/2}$(level)	E(γ) (keV)
0.0	ABCDE	5/2+	7880 y 120 % α = 100	

T1/2 = 7880 y (120)

^{229}Th half-life (NuDAT) – decay radiation information

Authors: A. K. Jain , R. Raut , J. K. Tuli Citation:Nuclear Data Sheets 110, 1409 (2009)

Parent Nucleus	Parent E(level)	Parent Jπ	Parent $T_{1/2}$	Decay Mode	GS-GS Q-value (keV)	Daughter Nucleus	Decay Scheme	ENSDF file
$^{229}_{90}$Th	0.0	5/2+	7340 y *160*	α: 100 %	5168.1 *12*	$^{225}_{88}$Ra		

T1/2 = 7340 y (160)

Half-life retrieval

- Users often reference NNDC web site instead of a printed version
  - Reference of the printed version is easier for tracking and evaluators get citation credit
  - If from the Wallet Card – provide information for citation

$T_{1/2}$ = 7932 y (28)

Source is missing

Ground and isomeric state information for $^{229}_{90}Th$

E(level) (MeV)	Jn	Mass Excess (keV)	$T_{1/2}$	Decay Modes
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Other items for discussion

- NSDD action items:
  - **How to proceed**

Action #3: Balraj Singh will re-write an addendum to the guidelines regarding all four issues listed in the action. Evaluators should communicate to him any other issues they identify in the guidelines (See new **Action item #11**).

11	McMaster (B. Singh) All Evaluators	Policy implementation: check and modify *Guidelines for Evaluators*.	Prepare addendum with new items recorded in the recent meetings and not included in the Guidelines for Evaluators published in 2021 (including items of Action #3 of INDC(NDS)-0850). Share new document with evaluators for feedback. Recommendation to evaluators: to share with Balraj comments and suggestions on the existing Guidelines for anything missing