

¹⁶⁸Er(²⁷Al,5nγ) 1981Kr20

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, ¹ and Jun Chen ²		NDS 169, 1 (2020)	15-Oct-2020

Includes ¹⁶⁹Tm(²⁵Mg,4nγ) and ¹⁷⁶Hf(¹⁹F,5nγ).

1981Kr20: ¹⁶⁸Er(²⁷Al,5nγ) E=130-160 MeV; ¹⁶⁹Tm(²⁵Mg,4nγ) E=120 MeV; ¹⁷⁶Hf(¹⁹F,5nγ) E=85-120 MeV. Measured γ, γ(t), γ(θ), γγ, excitation functions. Isotopic assignment made by cross bombardment, intensity balance and Tl K x ray intensity. An isomer of 0.75 ms and J^π=8⁻, decaying by a 161.9γ to the 89-keV level proposed in this work, in addition to a 272.4 – 280.5 – 382.2 γ cascade.

¹⁹⁰Tl Levels

E(level)	J ^π	T _{1/2}	Comments
83? 10	7 ⁺	3.6 min 3	%ε+%β ⁺ =100 Additional information 1.
245? 10	8 ⁻	0.75 ms 4	E(level),J ^π ,T _{1/2} : from the Adopted Levels. %IT=100 E(level),J ^π : isomer from 1981Kr20 only, considered as uncertain by evaluators. In the Adopted dataset, isomer is tentatively placed from a level of unknown energy decaying possibly by a low-energy (highly converted) transition to the 245 level. Existence of this isomer in ¹⁹⁰ Tl needs to be confirmed. T _{1/2} : from γ(t) with beam pulses (1981Kr20). E(level): 1991Va04 (from ¹⁹⁴ Bi α decay) suggest that the placement of 161.9γ from this level is incorrect.
x [†]			E(level): x corresponds to 389.0 keV in the Adopted dataset.
272.4+x [†]	(11,12) ⁻		E(level): corresponds to 661.3, (11 ⁻) level in the Adopted dataset.
652.8+x [†]	(12,13) ⁻		E(level): corresponds to 941.8, (12 ⁻) level in the Adopted dataset.
1035.0+x [†]	(13,14) ⁻		E(level): corresponds to 1324.2, (13 ⁻) level in the Adopted dataset.

[†] Band(A): πh_{9/2}⊗v_{13/2}.

γ(¹⁹⁰Tl)

E _γ	E _i (level)	J _i ^π	E _f	J _f ^π	Mult.	δ	α [†]	Comments
161.9 [‡] 2	245?	8 ⁻	83?	7 ⁺	(E1+M2)	0.50 5	2.6 4	α(K)exp=1.9 3 (1981Kr20) α(K)=1.8 3; α(L)=0.56 9; α(M)=0.140 22 α(N)=0.036 6; α(O)=0.0068 11; α(P)=0.00057 9 Mult.,δ: from α(K)exp (measured from K x rays and Iγ), considered as tentative by evaluators as not confirmed in other studies. 1991Va04 (in ¹⁹⁴ Bi α decay study) suggest that the placement of this γ from 250.9, (8 ⁻) level is incorrect for the following reasons: no (10 ⁻) to (8 ⁻) α transition observed, no coincidences observed between 5598α and 5660α with a possible (9 ⁻) to (8 ⁻) M1 γ transition, and E1 hindrance factor of 161.9γ is high by three to four orders of magnitude, as compared to those for neighboring Tl nuclides.
272.4	272.4+x	(11,12) ⁻	x					

Continued on next page (footnotes at end of table)

$^{168}\text{Er}(^{27}\text{Al},5n\gamma)$ **1981Kr20** (continued) $\gamma(^{190}\text{Tl})$ (continued)

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π
380.4	652.8+x	(12,13) ⁻	272.4+x	(11,12) ⁻
382.2	1035.0+x	(13,14) ⁻	652.8+x	(12,13) ⁻

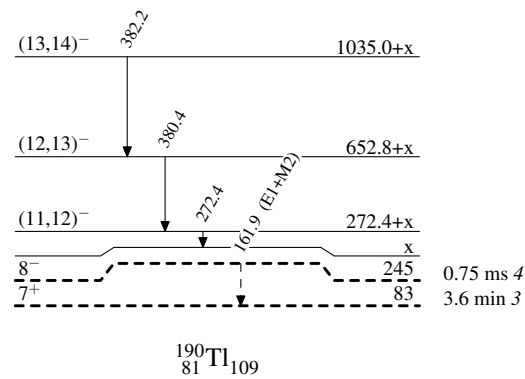
† Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

‡ Placement of transition in the level scheme is uncertain.

 $^{168}\text{Er}(^{27}\text{Al},5n\gamma)$ **1981Kr20**

Legend

Level Scheme

-----► γ Decay (Uncertain)

$^{168}\text{Er}(^{27}\text{Al},5\text{n}\gamma)$ 1981Kr20