

²⁸⁰Rg α decay (4.4 s) 2015Ga24,2013Ru11,2013Og01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 156, 148 (2019)	31-Jan-2019

Parent: ²⁸⁰Rg: E=0; T_{1/2}=4.4 s +5-4; Q(α)=10146 7; % α decay \approx 100.0

²⁸⁰Rg-T_{1/2}: From ²⁸⁰Rg Adopted Levels.

²⁸⁰Rg-Q(α): From 2017Wa10.

²⁸⁰Rg produced in α -decay chain: ²⁸⁸Mc -> ²⁸⁴Nh -> ²⁸⁰Rg; ²⁸⁸Mc produced in ²⁴³Am(⁴⁸Ca,X) reaction. See ²⁸⁸Mc Adopted Levels for details of production of this isotope.

2012Og02, 2013Og01: measured E α , decay times.

2013Ru11: measured E α , E γ , $\alpha\gamma$ -coin; deduced first level scheme of ²⁷⁶Mt.

2015Ga24: measured E α , E γ , $\alpha\gamma$ -coin; deduced level scheme of ²⁷⁶Mt in conjunction with the work of 2013Ru11. No K x-rays were observed.

²⁷⁶Mt Levels

E(level) [†]	T _{1/2}	Comments
0.0	0.69 s +9-7	T _{1/2} : from Adopted Levels.
194 1		
237.4 5		
279.6? 22		
731.6? 14		

[†] From E γ data.

α radiations

HF=T_{1/2}^{exp}/T_{1/2}^{sys}, where experimental half-life of ²⁸⁰Rg was used as 4.1 s +5-4, based on data from 2015Ga24, and those in 2013Ru11 and 2013Og01. The systematic half-life was from the formalism of 2009Qi07.

E α	E(level)	I α [†]	Comments
9860 20			E α : from E α (max)=10.31 MeV 2 (2015Ga24), interpreted as E α =9.86 MeV 2+(E γ =452.7 25), observed in $\alpha\gamma$ -coincidence. 2015Ga24 concluded that E α -max is larger compared to adopted E α -max=10.01 MeV 1, and considered it as a random coincidence and did not include in the level scheme.
9280 20	731.6?	10	HF: 11 1 (2015Ga24).
9750 20	279.6?	10	E α : from text. Also listed as 9.72 MeV in Figure 2. Other: 9.75 MeV 6 (2004Og03). HF: 230 30 (2015Ga24).
9770 10	237.4	60	E α : From text. In Figure 2, the energy is shown as 9.76 MeV . HF: 50 +7-6 (2015Ga24). Other: 35 +9-6 (2013Ru11), when both the 237 γ and 194 γ were assumed to be from the 237 level.
9820 10	194	20	E α : Also listed as 9.81 MeV in the text, and 9.80 MeV in Figure 2. Assumed as g.s. to g.s. α transition. HF: 200 +30-20 (2015Ga24).

[†] For absolute intensity per 100 decays, multiply by \approx 1.0.

^{280}Rg α decay (4.4 s) **2015Ga24,2013Ru11,2013Og01** (continued)

$\gamma(^{276}\text{Mt})$						
E_γ	Number of γ counts	$E_i(\text{level})$	E_f	Mult.	α^\dagger	Comments
194 1	2	194	0.0	(E1)	0.1391	E_γ : from 2013Ru11 . Mult.: from 2013Ru11 , based on expected 0.13 K x-rays and 0.2 $\alpha+e^-$ summing events above 9.9 MeV in the α spectrum per 194 γ .
237.4 5	6	237.4	0.0	(E1)	0.0926	In 2013Ru11 , 237 γ and 194 γ were placed in parallel from 237 level, and the 194 γ to a 43-keV level. Mult.: from 2015Ga24 and 2013Ru11 , based on expected 0.11 K x-rays and 0.2 $\alpha+e^-$ summing events above 9.9 MeV in the α spectrum per 237.4 γ .
279.6 ‡ 22 ^x 452.7 25	1	279.6?	0.0	[E1]	0.0670	E_γ : from $E\alpha(\text{max})=10.31$ MeV 2 (2015Ga24), interpreted as $E\alpha=9.86$ MeV 2+($E_\gamma=452.7$ 25), observed in $\alpha\gamma$ -coincidence. 2015Ga24 concluded that $E\alpha$ -max is larger compared to adopted $E\alpha$ -max=10.01 MeV 1, and considered it as a random coincidence and did not include in the level scheme.
494.2 ‡ 13	1	731.6?	237.4	[E2]	0.1448	

† 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.

^x γ ray not placed in level scheme.

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