

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. Morse	NDS 197,259 (2024).	26-Sep-2023

Q(β^-)=-3.62×10³ 6; S(n)=7667 7; S(p)=5571 5; Q(α)=5992.5 5 [2021Wa16](#)
 S(2n)=13748 14, S(2p)=9734 5 ([2021Wa16](#)).

²³⁰U Levels

Cross Reference (XREF) Flags

- A ²³⁴Pu α decay
- B ²³⁰Pa β^- decay
- C ²³²Th($\alpha,6n\gamma$)
- D ²³¹Pa(p,2n γ), ²³⁰Th($\alpha,4n\gamma$)

E(level) [†]	J π [‡]	T _{1/2}	XREF	Comments
0.0 [#]	0 ⁺	20.23 d 2	ABCD	% α =100 % ²² Ne=4.8×-12 20 from 2001Bo11 , measured using glass track detectors. Other: 1.3×10 ⁻¹² 8 (2000Pa54) measured using polyester detectors. Both used source from ²³⁰ Pa decay. 2001Bo11 claim much lower α background. T _{1/2} : from 2012Po12 . Other: 20.8 d (1948St42).
51.737 [#] 23	2 ⁺	0.26 ns 3	ABCD	T _{1/2} : From (β)(51.7 γ)(t) in ²³⁰ Pa β^- decay (1960Be25). J π : 51.72 γ E2 to 0 ⁺ .
169.35 [#] 4	4 ⁺		ABCD	J π : 117.8 γ E2 to 2 ⁺ .
346.96 [#] 20	6 ⁺		CD	J π : 177.6 γ E2 to 4 ⁺ .
366.654 [@] 18	(1 ⁻)		B D	J π : 366.6 γ E1 to 0 ⁺ ; systematics of octupole bands and decay pattern.
435.20 [@] 3	(3 ⁻)		B D	J π : 265.8 γ E1 to 4 ⁺ , 383.5 γ E1 to 2 ⁺ ; systematics of octupole bands and decay pattern.
558.2 [@] 7	(5 ⁻)		D	
578.1 [#] 3	8 ⁺		CD	J π : 231 γ E2 to 6 ⁺ .
734.0 [@] 10	(7 ⁻)		CD	
856.3 [#] 3	10 ⁺		CD	
958.6 [@] 6	(9 ⁻)		CD	
1175.6 [#] 4	12 ⁺		CD	
1229.0 [@] 6	(11 ⁻)		CD	
1531.5 [#] 4	14 ⁺		CD	
1539.7 [@] 6	(13 ⁻)		CD	
1885.9 [@] 5	(15 ⁻)		CD	
1921.0 [#] 5	16 ⁺		CD	
2266.5 [@] 6	(17 ⁻)		CD	
2337.6 [#] 6	(18 ⁺)		CD	
2779.6 [#] 11	(20 ⁺)		C	
3243.6 [#] 15	(22 ⁺)		C	

[†] Deduced by evaluator from a least-squares fit to adopted γ -ray energies.

[‡] Spin/parity assignments for higher-lying states are based on assignment to g.s. rotational band or octupole-vibrational band.

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Adopted Levels, Gammas (continued)

²³⁰U Levels (continued)

Specific arguments based on γ -ray multiplicities are given for individual levels.

Band(A): $K^\pi=0^+$ g.s. rotational band.

@ Band(B): $K^\pi=0^-$ octupole-vibrational band.

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	$\gamma(^{230}\text{U})$		Comments
						Mult.‡	$\alpha\&$	
51.737	2 ⁺	51.75 4	100	0.0	0 ⁺	E2	307 4	$\alpha(\text{L})=223.7$ 32; $\alpha(\text{M})=61.9$ 9; $\alpha(\text{N})=16.77$ 24; $\alpha(\text{O})=3.84$ 6; $\alpha(\text{P})=0.623$ 9; $\alpha(\text{Q})=0.001583$ 23 B(E2)(W.u.)=222 27 E_γ : Weighted average of 51.77 keV 5 (1970Lo02) and 51.72 keV 5 (1971Ku25).
169.35	4 ⁺	117.8 2	100	51.737	2 ⁺	E2	6.43 10	$\alpha(\text{K})=0.1894$ 29; $\alpha(\text{L})=4.55$ 7; $\alpha(\text{M})=1.261$ 20; $\alpha(\text{N})=0.342$ 5; $\alpha(\text{O})=0.0787$ 13
346.96	6 ⁺	177.6 2	100	169.35	4 ⁺	E2	1.174 17	$\alpha(\text{P})=0.01293$ 21; $\alpha(\text{Q})=6.15 \times 10^{-5}$ 9 $\alpha(\text{K})=0.1842$ 26; $\alpha(\text{L})=0.722$ 11; $\alpha(\text{M})=0.1992$ 30; $\alpha(\text{N})=0.0541$ 8; $\alpha(\text{O})=0.01248$ 19
366.654	(1 ⁻)	314.92 [#] 2	100 [#] 5	51.737	2 ⁺	E1 [#]	0.0353 5	$\alpha(\text{P})=0.002076$ 31; $\alpha(\text{Q})=1.735 \times 10^{-5}$ 25 $\alpha(\text{K})=0.0281$ 4; $\alpha(\text{L})=0.00540$ 8; $\alpha(\text{M})=0.001301$ 18; $\alpha(\text{N})=0.000348$ 5; $\alpha(\text{O})=8.31 \times 10^{-5}$ 12 $\alpha(\text{P})=1.535 \times 10^{-5}$ 21; $\alpha(\text{Q})=9.93 \times 10^{-7}$ 14
		366.65 [#] 2	81 [#] 5	0.0	0 ⁺	E1 [#]	0.0254 4	$\alpha(\text{K})=0.02038$ 29; $\alpha(\text{L})=0.00383$ 5; $\alpha(\text{M})=0.000920$ 13; $\alpha(\text{N})=0.0002463$ 34 $\alpha(\text{O})=5.90 \times 10^{-5}$ 8; $\alpha(\text{P})=1.096 \times 10^{-5}$ 15; $\alpha(\text{Q})=7.31 \times 10^{-7}$ 10
435.20	(3 ⁻)	265.85 [#] 3	38 [#] 4	169.35	4 ⁺	E1 [#]	0.0513 7	$\alpha(\text{K})=0.0407$ 6; $\alpha(\text{L})=0.00801$ 11; $\alpha(\text{M})=0.001935$ 27; $\alpha(\text{N})=0.000517$ 7 $\alpha(\text{O})=0.0001233$ 17; $\alpha(\text{P})=2.261 \times 10^{-5}$ 32; $\alpha(\text{Q})=1.410 \times 10^{-6}$ 20
		383.46 [#] 2	100 [#] 5	51.737	2 ⁺	E1 [#]	0.02315 32	$\alpha(\text{K})=0.01857$ 26; $\alpha(\text{L})=0.00347$ 5; $\alpha(\text{M})=0.000833$ 12; $\alpha(\text{N})=0.0002229$ 31 $\alpha(\text{O})=5.34 \times 10^{-5}$ 7; $\alpha(\text{P})=9.94 \times 10^{-6}$ 14; $\alpha(\text{Q})=6.68 \times 10^{-7}$ 9
558.2	(5 ⁻)	211.1		346.96	6 ⁺			
		388.9		169.35	4 ⁺			
578.1	8 ⁺	231.1 2	100	346.96	6 ⁺	E2	0.444 6	$\alpha(\text{K})=0.1212$ 17; $\alpha(\text{L})=0.2358$ 34; $\alpha(\text{M})=0.0646$ 9; $\alpha(\text{N})=0.01754$ 25; $\alpha(\text{O})=0.00406$ 6 $\alpha(\text{P})=0.000683$ 10; $\alpha(\text{Q})=8.60 \times 10^{-6}$ 12
734.0	(7 ⁻)	387.0	100	346.96	6 ⁺			
856.3	10 ⁺	278.2 2	100	578.1	8 ⁺			
958.6	(9 ⁻)	380.8	100	578.1	8 ⁺			
1175.6	12 ⁺	319.3 2	100	856.3	10 ⁺			
1229.0	(11 ⁻)	270.4 2	35.7	958.6	(9 ⁻)			
		372.6	≈ 100	856.3	10 ⁺			
1531.5	14 ⁺	355.9 2		1175.6	12 ⁺			

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Adopted Levels, Gammas (continued) $\gamma({}^{230}\text{U})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π	$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\dagger	E_f	J_f^π
1539.7	(13 ⁻)	310.7 2	28.6	1229.0	(11 ⁻)	2266.5?	(17 ⁻)	345.5 2		1921.0	16 ⁺
		364.0	≈ 100	1175.6	12 ⁺			380 @		1885.9	(15 ⁻)
1885.9	(15 ⁻)	346 @		1539.7	(13 ⁻)	2337.6?	(18 ⁺)	416.6 ^a 2	100	1921.0	16 ⁺
		354.4 2		1531.5	14 ⁺	2779.6	(20 ⁺)	442 @	100	2337.6?	(18 ⁺)
1921.0	16 ⁺	389.6 3	100	1531.5	14 ⁺	3243.6	(22 ⁺)	464 @	100	2779.6	(20 ⁺)

[†] From ${}^{231}\text{Pa}(\text{p},2\text{n}\gamma)$, ${}^{230}\text{Th}(\alpha,4\text{n}\gamma)$, unless otherwise specified.

[‡] From ce measurements in ${}^{230}\text{Pa} \beta^-$ decay and in $(\alpha,4\text{n}\gamma)$ reaction.

From ${}^{230}\text{Pa} \beta^-$ Decay.

@ From ${}^{232}\text{Th}(\alpha,6\text{n}\gamma)$.

& [Additional information 1](#).

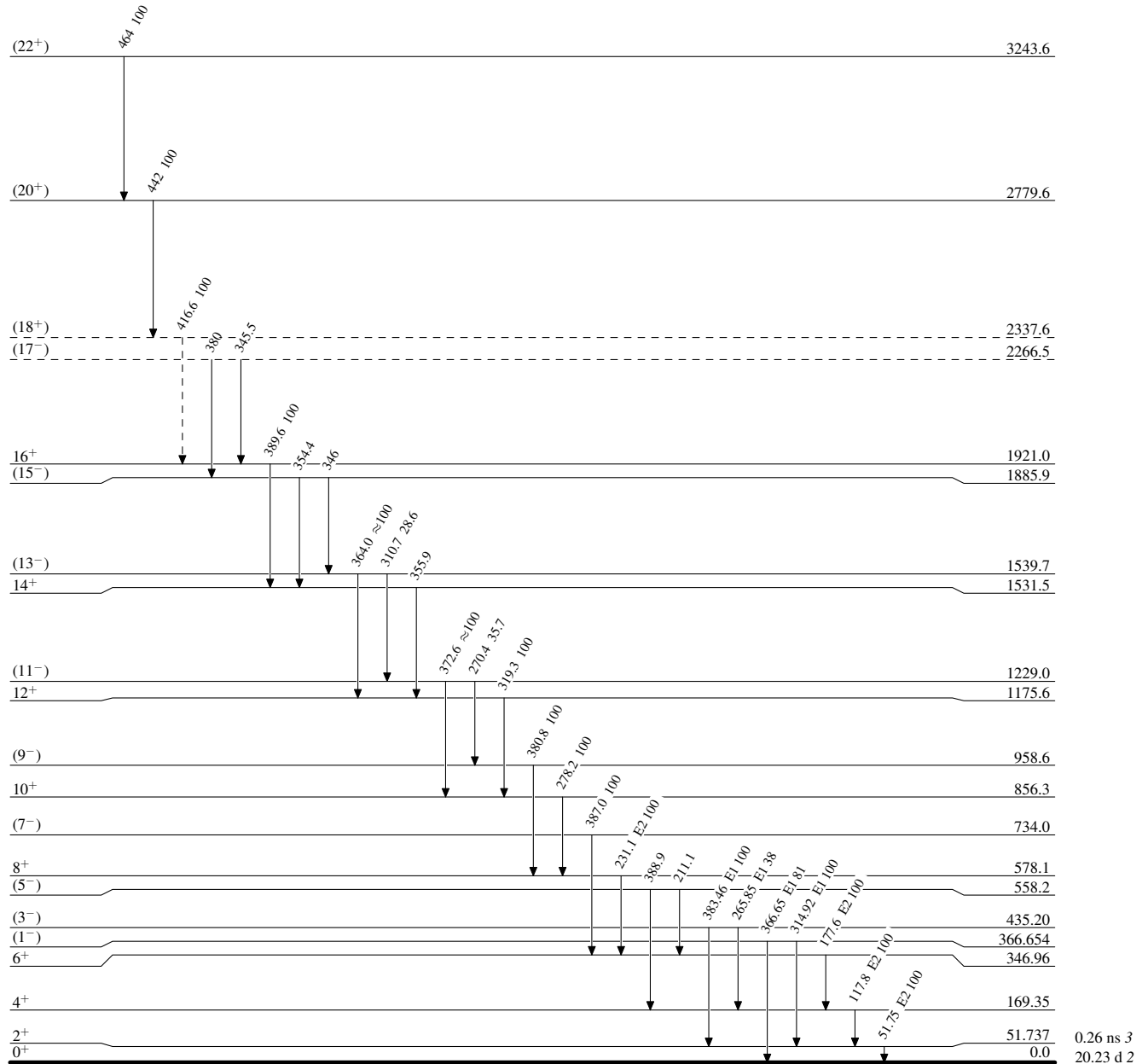
^a Placement of transition in the level scheme is uncertain.

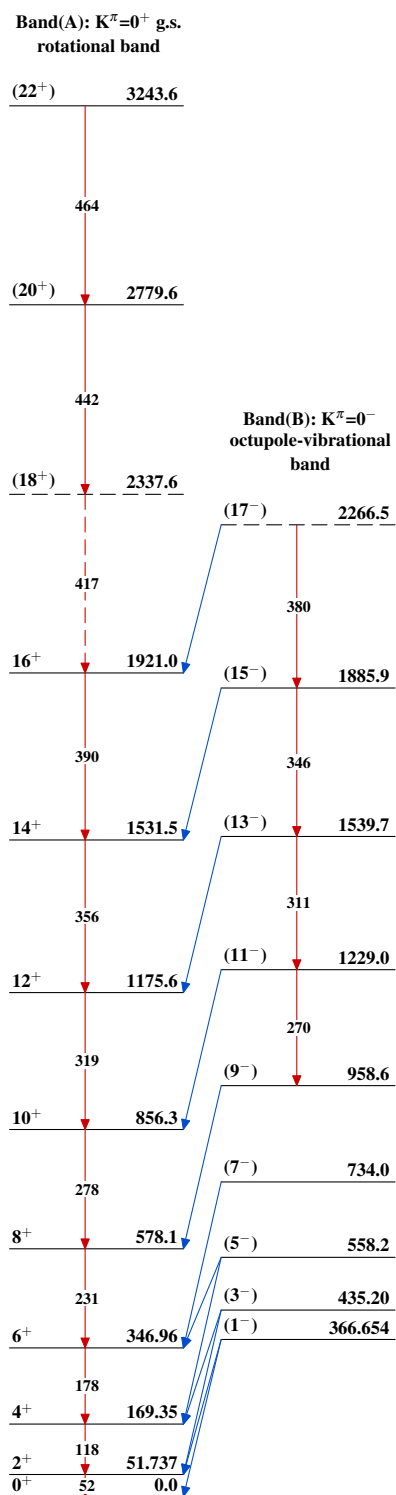
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----▶ γ Decay (Uncertain) $^{230}_{92}\text{U}_{138}$ 0.26 ns 3
20.23 d 2

Adopted Levels, Gammas ${}^{230}_{92}\text{U}_{138}$