

$\text{Ir}(\alpha, xn\gamma), ^{193}\text{Ir}(^3\text{He}, 4n\gamma)$ **1976RoZE, 1980RoZT, 1982Ne05**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 1871 (2012)	15-Jun-2012

1976RoZE, 1980RoZT: $^{191}\text{Ir}(\alpha, 3n\gamma)$ ($E(\alpha)=38$ MeV, iridium targets enriched to 94.3% in ^{191}Ir), $^{193}\text{Ir}(^3\text{He}, 4n\gamma)$ ($E(^3\text{He})=31$ MeV, iridium targets enriched to 99.7% in ^{193}Ir); measured $E\gamma$, $I\gamma$, $E(\text{ce})$, Ice , $(\text{ce})(\text{ce})$ coin, $\gamma\gamma$ coin, $\text{Ce}(\text{t})$.

1982Ne05: $^{193}\text{Ir}(\alpha, 5n\gamma)$ ($E(\alpha)=61.5, 63$ MeV, iridium targets enriched to 98% in ^{193}Ir); measured $E\gamma$, $I\gamma$ ($\text{Ge}(\text{Li})$), $E(\text{ce})$, Ice (mag spect), four-parameter $\gamma\gamma$ coin, γ -ray angular distributions (90° to 165° in 15° steps), γ -ray timing spectra; used triaxial-rotor-plus-particle model to interpret level structure.

The level scheme is from **1982Ne05**. γ -ray data for levels below the 11^- isomer are from **1976RoZE, 1980RoZT**; γ -ray data for higher levels are from **1982Ne05** and **1979Ne01** (earlier work by authors of **1982Ne05**).

Conflicting data, attributed to ^{192}Au in $^{191}\text{Ir}(\alpha, 3n\gamma)$ (**1975La21**), belong to ^{194}Au .

 ^{192}Au Levels

E(level)	J^π †	$T_{1/2}$	Comments
0.0‡	1^-	4.94 h 9	$T_{1/2}$: adopted value.
31.7‡ 3	2^-	0.69 ns 2	$T_{1/2}$: adopted value.
72.7‡ 4	3^-		
135.5# 4	5^+	29 ms	$T_{1/2}$: $\text{Ce}(\text{t})$ (1976RoZE, 1980RoZT).
225.0# 5	6^+		
243.0# 5	7^+		
371.9# 5	8^+		
431.7@ 6	11^-	160 ms 20	%IT=100 $T_{1/2}$: γ -ray timing spectra (1982Ne05). Other value: 167 ms ($\text{Ce}(\text{t})$; 1976RoZE, 1980RoZT).
659.4& 7	12^-		
839.4@ 7	13^-		
1099.2& 7	14^-		
1547.4@ 7	15^-		
1819.7& 7	16^-		
1963.0 ^a 7	$15^{(+)}$		
2176.3 ^a 7	$17^{(+)}$		
2316.5@ 7	17^-		
2431.4 8	(18)		
2517.0 9	(18)		
2582.4 8	(20)		
2608.0& 7	18^-		
2978.2 9	(20)		
3014.0 10	(20)		
3317.4 11	(22)		
3525.0 10	(22)		

† From **1982Ne05**, based on γ multiplicities, coincidence data, and band structure. See ^{192}Au Adopted Levels for evaluator's assignments.

‡ Band(A): $\pi=-$ g.s. sequence.

Band(B): $\pi=+$ sequence. Built on $(5)^+$ 29 ms $I35$ level.

@ Band(c): $\alpha=1$ rotation-aligned band. Built on 11^- level, Configuration= $((\pi h_{11/2})^{-1}(\nu i_{13/2})^{-1})$ (**1979vE01**).

& Band(C): $\alpha=0$ rotation-aligned band. Built on 11^- level, Configuration= $((\pi h_{11/2})^{-1}(\nu i_{13/2})^{-1})$ (**1979vE01**).

^a Band(D): member of side cascade populating rotation-aligned band. Possible Configuration= $((\pi h_{11/2})^{-1}(\nu i_{13/2})^{-2}(\nu j))$ (with $j=p_{1/2}, p_{3/2}$ or $f_{5/2}$) (for 15^+ and 17^+ states) (**1982NE05**).

Ir($\alpha, xn\gamma$), ¹⁹³Ir(³He, 4n γ) 1976RoZE, 1980RoZT, 1982Ne05 (continued)

$\gamma(^{192}\text{Au})$									
E_γ^\dagger	I_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	δ^\ddagger	α^b	Comments
(18.0 7)		243.0	7 ⁺	225.0	6 ⁺				E_γ : from energy difference between 243.0 and 225.0 levels.
31.7# 3		31.7	2 ⁻	0.0	1 ⁻	M1+E2@	0.082@	45.4 16	
41.0# 3		72.7	3 ⁻	31.7	2 ⁻	M1+E2@	0.063@	18.9 5	
59.8# 3		431.7	11 ⁻	371.9	8 ⁺	E3@		2.44×10 ³ 8	
62.8# 3		135.5	5 ⁺	72.7	3 ⁻	M2@		157 4	
89.5# 3		225.0	6 ⁺	135.5	5 ⁺	M1+E2@	0.18@	9.91 17	
103.8# 3		135.5	5 ⁺	31.7	2 ⁻	E3@		103.3 23	
107.5# 3		243.0	7 ⁺	135.5	5 ⁺	E2@		3.86 7	
128.9# 3		371.9	8 ⁺	243.0	7 ⁺	M1+E2@	1.0@	2.69 5	
146.9# 3		371.9	8 ⁺	225.0	6 ⁺	E2@		1.133 19	
151.0 3	0.2 1	2582.4	(20)	2431.4	(18)	(Q)			A ₂ =+0.21 4, A ₄ =-0.14 6 (1982Ne05).
180.1 3	1.4 2	839.4	13 ⁻	659.4	12 ⁻	D(+Q)	-0.03 7		A ₂ =-0.22 3, A ₄ =-0.02 5 (1982Ne05).
213.2 3	1.7 2	2176.3	17 ⁽⁺⁾	1963.0	15 ⁽⁺⁾	Q			A ₂ =+0.34 2, A ₄ =-0.09 3 (1982Ne05).
227.7 3	3.9 3	659.4	12 ⁻	431.7	11 ⁻	D+Q	+0.09 4		A ₂ =-0.07 2, A ₄ =-0.03 3 (1982Ne05).
255.1 3	0.6 2	2431.4	(18)	2176.3	17 ⁽⁺⁾				A ₂ =-0.06 2, A ₄ =+0.02 3 (1982Ne05).
259.7 3	3.6 3	1099.2	14 ⁻	839.4	13 ⁻	D+Q	+0.09 4		A ₂ =-0.06 2, A ₄ =-0.02 3 (1982Ne05).
272.2 3	0.3 1	1819.7	16 ⁻	1547.4	15 ⁻	D+Q	+0.08 4		A ₂ =-0.09 5, A ₄ =-0.01 7 (1982Ne05).
291.4 3	0.3 1	2608.0	18 ⁻	2316.5	17 ⁻	D(+Q)	+0.04 5		A ₂ =-0.16 6, A ₄ =+0.02 9 (1982Ne05).
339.2 5	0.8& 3	3317.4	(22)	2978.2	(20)	(Q)			A ₂ =+0.17 4, A ₄ =+0.01 6 (1982Ne05) for contaminated line. I_γ : combined value for 339.2 γ and 340.7 γ .
340.7 5	0.8& 3	2517.0	(18)	2176.3	17 ⁽⁺⁾				A ₂ =+0.01 3, A ₄ =-0.05 6 (1982Ne05) for contaminated line. I_γ : combined value for 339.2 γ and 340.7 γ .
356.6 3	0.3& 1	2176.3	17 ⁽⁺⁾	1819.7	16 ⁻	D ^a			A ₂ =-0.09 3, A ₄ =-0.07 5 (1982Ne05).
407.7 3	4.6& 3	839.4	13 ⁻	431.7	11 ⁻	Q			A ₂ =+0.29 3, A ₄ =-0.06 5 (1982Ne05).
415.9 3	0.2& 1	1963.0	15 ⁽⁺⁾	1547.4	15 ⁻	D ^a			A ₂ =+0.04 7, A ₄ =-0.18 11 (1982Ne05).
439.8 3	1.0 3	1099.2	14 ⁻	659.4	12 ⁻	Q			A ₂ =+0.32 2, A ₄ =-0.04 3 (1982Ne05).
448.2 3	0.7 2	1547.4	15 ⁻	1099.2	14 ⁻	D+Q	+0.05 4		A ₂ =-0.11 2, A ₄ =-0.02 3 (1982Ne05).
461.2 3	0.6& 2	2978.2	(20)	2517.0	(18)	Q			A ₂ =+0.32 3, A ₄ =-0.09 4 (1982Ne05).
496.6 5	0.2& 1	2316.5	17 ⁻	1819.7	16 ⁻				A ₂ =+0.11 5, A ₄ =-0.04 7 (1982Ne05) for doublet.

Continued on next page (footnotes at end of table)

$\text{Ir}(\alpha, xn\gamma), ^{193}\text{Ir}(^3\text{He}, 4n\gamma)$ **1976RoZE, 1980RoZT, 1982Ne05** (continued) $\gamma(^{192}\text{Au})$ (continued)

E_γ [†]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [‡]	Comments
497.0 5	0.2 ^{&} 1	3014.0	(20)	2517.0 (18)			$A_2=+0.11$ 5, $A_4=-0.04$ 7 (1982Ne05) for doublet.
546.8 3	0.2 1	3525.0	(22)	2978.2 (20)		(Q)	$A_2=+0.20$ 4, $A_4=+0.02$ 6 (1982Ne05).
708.0 3	1.4 ^{&} 2	1547.4	15 ⁻	839.4 13 ⁻		Q	$A_2=+0.38$ 2, $A_4=-0.08$ 3 (1982Ne05).
720.8 3	0.9 2	1819.7	16 ⁻	1099.2 14 ⁻		Q	$A_2=+0.26$ 3, $A_4=-0.06$ 5 (1982Ne05).
769.0 3	0.4 1	2316.5	17 ⁻	1547.4 15 ⁻		Q	$A_2=+0.27$ 5, $A_4=-0.07$ 7 (1982Ne05).
788.5 3	0.4 1	2608.0	18 ⁻	1819.7 16 ⁻		Q	$A_2=+0.30$ 4, $A_4=-0.09$ 6 (1982Ne05).
863.5 3	2.9 3	1963.0	15 ⁽⁺⁾	1099.2 14 ⁻		D ^a	$A_2=-0.20$ 1, $A_4=-0.04$ 2 (1982Ne05).

[†] From 1982Ne05, except where noted. I_γ is for $(\alpha, 5n\gamma)$ at 61.5 MeV.

[‡] From γ -ray angular distributions (1979Ne01, 1982Ne05), unless noted otherwise; stretched Q assignments (based on large positive A_2 and small negative A_4) and D(+Q) assignments (based on rotational-band structure and negative A_2) are interpreted by the authors as E2 and M1(+E2), respectively.

[#] From 1976RoZE, 1980RoZT; ΔE not reported, but estimated by evaluator from implied precision of authors' energies.

[@] From unenumerated ce data in 1976RoZE, 1980RoZT.

[&] From $\gamma\gamma$ coin data (1982Ne05).

^a $863.5\gamma(\theta)$ is consistent with pure D, $\Delta J=1$. 1982Ne05 favor an E1 assignment; the level scheme would then require the D 356.6 and 415.9 transitions to be E1 also, but $\gamma(\theta)$ differs from what is expected for pure D.

^b 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.

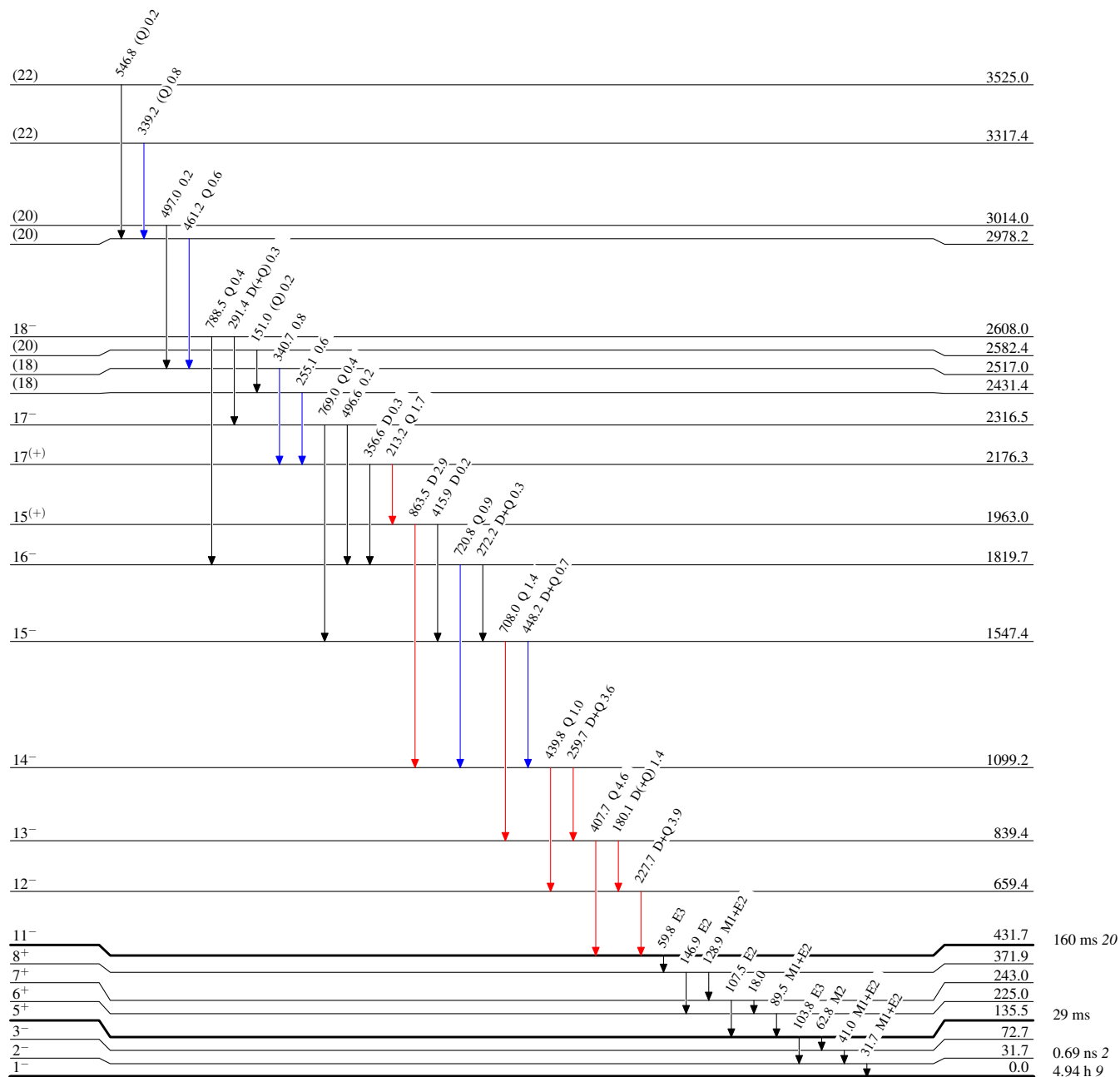
Ir($\alpha, xn\gamma$), ¹⁹³Ir(³He, 4n γ) 1976RoZE, 1980RoZT, 1982Ne05

Legend

Level Scheme

Intensities: Relative I γ for ¹⁹³Ir($\alpha, 5n\gamma$), E(α)=61.5 MeV

- I γ < 2% × I γ^{max}
- I γ < 10% × I γ^{max}
- I γ > 10% × I γ^{max}
- - - - - γ Decay (Uncertain)



¹⁹²Au₁₁₃

$\text{Ir}(\alpha, xn\gamma), ^{193}\text{Ir}(^3\text{He}, 4n\gamma)$ 1976RoZE, 1980RoZT, 1982Ne05