

¹⁰⁸Pd(⁴⁰Ar,4n γ) 1994Rz01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. A. Sonzogni	NDS 93, 599 (2001)	1-Dec-2000

E=182 MeV. Measured E γ , $\gamma(\theta)$, $\gamma\gamma$, $\gamma(t)$. OSIRIS spectrometer: 12 Compton-suppressed Ge detectors + 48 BGO scintillators.

¹⁴⁴Gd Levels

E(level)	J π [†]	T _{1/2}	E(level)	J π [†]	E(level)	J π [†]	E(level)	J π [†]
0.0	0 ⁺		5371.2	14 ⁺	6749		8541	(22 ⁺)
743.0	2 ⁺		5456.2	(14 ⁺)	6825.8	16 ⁺	8596	(22 ⁺)
1702.3	3 ⁻		5488.1	14 ⁺	6929	(18 ⁺)	8642	(24 ⁺)
1744.5	4 ⁺		5498.4	13 ⁺	7015	18 ⁺	8994	(23 ⁺)
2302.9	5 ⁻		5614.4	14 ⁺	7340		9071 [‡]	22 ⁺
2472.1	7 ⁻	13 ns	5627.7	14 ⁺	7350	19 ⁺	9080	(23 ⁺)
2787.3	7 ⁻		5724.1	15 ⁺	7350.9	18 ⁺	9199	(24 ⁺)
3018.8	8 ⁻		5836.5	15 ⁺	7353	(19 ⁺)	9604	
3245.2	8 ⁻		6214.9	16 ⁺	7420	19 ⁺	9864	(24 ⁺)
3346.9	9 ⁻		6234	16 ⁺	7570		9960 [‡]	(24 ⁺)
3434.3	10 ⁺	131 ns	6265.4	17 ⁺	7608	(20 ⁺)	10067	
4145.8	11 ⁺		6326		7757	20 ⁺	10425	
4452.1	12 ⁺		6382		7762		10443	(26 ⁺)
4757.3	12 ⁺		6383.2	17 ⁺	7887		10796 [‡]	(26 ⁺)
4955.2	12 ⁺		6434	(17 ⁺)	7924	20 ⁺	11180	(28 ⁺)
5087.6	13 ⁺		6444		8106 [‡]	20 ⁺	11725 [‡]	(28 ⁺)
5135.2	13 ⁺		6619.4	17 ⁺	8190	(21 ⁺)	12844 [‡]	(30 ⁺)
5180.7	14 ⁺		6671.2	16 ⁺	8222	(21 ⁺)	13942 [‡]	(32 ⁺)
5229.1	(14 ⁺)		6704.6	16 ⁺	8477	(22 ⁺)		

[†] As given by authors, from R(DCO) values.

[‡] Band(A): Positive parity band.

$\gamma(^{144}\text{Gd})$

E γ [#]	I γ [†]	E _i (level)	J π _i	E _f	J π _f	Mult. &	Comments
87.4 [‡]		3434.3	10 ⁺	3346.9	9 ⁻		
101.7 [‡]		3346.9	9 ⁻	3245.2	8 ⁻		
118.0	6	6383.2	17 ⁺	6265.4	17 ⁺		R(DCO)=0.76 18.
129.4	12	5627.7	14 ⁺	5498.4	13 ⁺	M1+(E2)	R(DCO)=0.58 10.
132.5	11	5087.6	13 ⁺	4955.2	12 ⁺	M1+(E2)	R(DCO)=0.65 14.
141.6	14	5229.1	(14 ⁺)	5087.6	13 ⁺		Double peak.
142.1	4	5371.2	14 ⁺	5229.1	(14 ⁺)		Double peak.
165.8	10	8642	(24 ⁺)	8477	(22 ⁺)		R(DCO)=0.81 12.
168.0	13	6383.2	17 ⁺	6214.9	16 ⁺		
169.2 [‡]		2472.1	7 ⁻	2302.9	5 ⁻		
199.4	3	6434	(17 ⁺)	6234	16 ⁺		R(DCO)=0.60 16.
208.9	26	5836.5	15 ⁺	5627.7	14 ⁺	M1+(E2)	R(DCO)=0.52 8.
219.9	5	7570		7350	19 ⁺		R(DCO)=0.67 22.
226.4 [‡]		3245.2	8 ⁻	3018.8	8 ⁻		
227.1	10	5456.2	(14 ⁺)	5229.1	(14 ⁺)		
231.5 [‡]		3018.8	8 ⁻	2787.3	7 ⁻		
236.0	20	5371.2	14 ⁺	5135.2	13 ⁺	M1+(E2)	Double peak. R(DCO)=0.56 8.
236.0	15	6619.4	17 ⁺	6383.2	17 ⁺		Double peak.

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$^{108}\text{Pd}(^{40}\text{Ar},4n\gamma)$ **1994Rz01 (continued)**

$\gamma(^{144}\text{Gd})$ (continued)

E_γ #	I_γ †	E_i (level)	J_i^π	E_f	J_f^π	Mult. &	Comments
255.1	6.5	7608	(20 ⁺)	7353	(19 ⁺)		R(DCO)=0.55 11.
267.5	2.5	7608	(20 ⁺)	7340			
267.9	7	5724.1	15 ⁺	5456.2	(14 ⁺)		
279.3	8.5	7887		7608	(20 ⁺)		
283.4 @	8	5371.2	14 ⁺	5087.6	13 ⁺	M1+E2	R(DCO)=1.9 6.
286.6	19	8477	(22 ⁺)	8190	(21 ⁺)		R(DCO)=0.46 7.
298.2	18	8222	(21 ⁺)	7924	20 ⁺	M1+(E2)	R(DCO)=0.41 7.
306.3 @	7	4452.1	12 ⁺	4145.8	11 ⁺	M1+E2	R(DCO)=2.1 4.
315.3 ‡		2787.3	7 ⁻	2472.1	7 ⁻		
317.7	6	5498.4	13 ⁺	5180.7	14 ⁺		Double peak.
318.7	9	8541	(22 ⁺)	8222	(21 ⁺)		Double peak. R(DCO)=0.41 9.
328.1 ‡		3346.9	9 ⁻	3018.8	8 ⁻		
334.9	18	7350	19 ⁺	7015	18 ⁺	M1+E2	R(DCO)=0.49 8.
352.9	32	5724.1	15 ⁺	5371.2	14 ⁺	M1+E2	R(DCO)=0.28 4.
374.1	8	8596	(22 ⁺)	8222	(21 ⁺)		
377.9 @	11	5135.2	13 ⁺	4757.3	12 ⁺	M1+E2	R(DCO)=1.2 3.
395.6	39	7015	18 ⁺	6619.4	17 ⁺	M1+(E2)	R(DCO)=0.42 7.
397.8	19	6234	16 ⁺	5836.5	15 ⁺		R(DCO)=0.43 8.
404.2	8	9604		9199	(24 ⁺)		Double peak.
404.5	24	7420	19 ⁺	7015	18 ⁺		Double peak.
404.8	20	6619.4	17 ⁺	6214.9	16 ⁺		Double peak.
407.2	14	7757	20 ⁺	7350	19 ⁺	M1+(E2)	Double peak. R(DCO)=0.35 7.
411.4	8	7340		6929	(18 ⁺)		R(DCO)=0.68 15.
415.5 ‡		3434.3	10 ⁺	3018.8	8 ⁻		
421.7		7762		7340			R(DCO)=0.72 23.
423.8	8	7353	(19 ⁺)	6929	(18 ⁺)		R(DCO)=0.43 14.
432.9	13	8190	(21 ⁺)	7757	20 ⁺	M1+(E2)	R(DCO)=0.41 7.
453.4	11	8994	(23 ⁺)	8541	(22 ⁺)	M1+(E2)	R(DCO)=0.48 9.
457.8 ‡		3245.2	8 ⁻	2787.3	7 ⁻		
463.1	11	10067		9604			
465.3	13	5836.5	15 ⁺	5371.2	14 ⁺	M1+E2	R(DCO)=0.8 3.
483.8	3	9080	(23 ⁺)	8596	(22 ⁺)		
490.6	29	6214.9	16 ⁺	5724.1	15 ⁺	M1+E2	R(DCO)=0.30 6.
492.5	11	5627.7	14 ⁺	5135.2	13 ⁺	M1+E2	
495.3	13	6929	(18 ⁺)	6434	(17 ⁺)		R(DCO)=0.64 12.
504.4	24	7924	20 ⁺	7420	19 ⁺	M1+E2	R(DCO)=0.41 7.
514.8		6749		6234	16 ⁺		
525.0	2	7350.9	18 ⁺	6825.8	16 ⁺	E2	R(DCO)=1.3 4.
541.4	12	6265.4	17 ⁺	5724.1	15 ⁺	E2	R(DCO)=1.09 22.
545.4	18	6382		5836.5	15 ⁺		Double peak.
546.6 ‡		3018.8	8 ⁻	2472.1	7 ⁻		
558.4 ‡		2302.9	5 ⁻	1744.5	4 ⁺		
561.7	7	10425		9864	(24 ⁺)		R(DCO)=0.70 14.
579.0	8	10443	(26 ⁺)	9864	(24 ⁺)	E2	R(DCO)=1.05 21.
600.6 ‡		2302.9	5 ⁻	1702.3	3 ⁻		
607.9	5.5	6444		5836.5	15 ⁺		R(DCO)=0.56 19.
611.5 @	18	4757.3	12 ⁺	4145.8	11 ⁺	M1+E2	R(DCO)=1.6 3.
620.2	3	8190	(21 ⁺)	7570			R(DCO)=0.58 19.
635.3	9	5087.6	13 ⁺	4452.1	12 ⁺	M1+E2	R(DCO)=0.29 8.
646.4	25	7350.9	18 ⁺	6704.6	16 ⁺	E2	R(DCO)=1.16 18.
679.8	16	7350.9	18 ⁺	6671.2	16 ⁺	E2	R(DCO)=1.07 19.

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$^{108}\text{Pd}(^{40}\text{Ar},4n\gamma)$ **1994Rz01** (continued) $\gamma(^{144}\text{Gd})$ (continued)

E_γ [#]	I_γ [†]	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. ^{&}	δ	Comments
711.5	65	4145.8	11 ⁺	3434.3	10 ⁺	M1+E2	-0.9 2	R(DCO)=0.9 2.
711.9		6326		5614.4	14 ⁺			
722.8	10	9199	(24 ⁺)	8477	(22 ⁺)			R(DCO)=0.95 18.
728.6	6	5180.7	14 ⁺	4452.1	12 ⁺	E2		R(DCO)=1.02 5.
736.9	4	11180	(28 ⁺)	10443	(26 ⁺)			
743.0 [‡]		743.0	2 ⁺	0.0	0 ⁺			
754.7	44	8106	20 ⁺	7350.9	18 ⁺	E2		R(DCO)=1.07 16.
792.6	18	9864	(24 ⁺)	9071	22 ⁺	E2		R(DCO)=1.18 20.
809.5 [@]	10	4955.2	12 ⁺	4145.8	11 ⁺	M1+E2		R(DCO)=1.20 23.
836.6	15	10796	(26 ⁺)	9960	(24 ⁺)	E2		R(DCO)=0.94 18.
888.8	32	9960	(24 ⁺)	9071	22 ⁺	E2		R(DCO)=1.04 16.
919.0	38	5371.2	14 ⁺	4452.1	12 ⁺	E2		R(DCO)=1.07 16.
928.5	3	11725	(28 ⁺)	10796	(26 ⁺)	(E2)		
941.8 [@]	11	5087.6	13 ⁺	4145.8	11 ⁺	E2		R(DCO)=4.3 9.
959.3 [‡]		1702.3	3 ⁻	743.0	2 ⁺			
961.1	2.5	9604		8642	(24 ⁺)			
965.4	36	9071	22 ⁺	8106	20 ⁺			R(DCO)=0.93 13.
989.4 [@]	21	5135.2	13 ⁺	4145.8	11 ⁺	E2		R(DCO)=3.8 7.
1001.5 [‡]		1744.5	4 ⁺	743.0	2 ⁺			
1017.8	100	4452.1	12 ⁺	3434.3	10 ⁺	E2		
1036.0	17	5488.1	14 ⁺	4452.1	12 ⁺			R(DCO)=0.91 15.
1046.3	12	5498.4	13 ⁺	4452.1	12 ⁺	M1+E2		R(DCO)=0.74 14.
1056.8	7	6671.2	16 ⁺	5614.4	14 ⁺	E2		R(DCO)=0.86 23.
1090.2	9	6704.6	16 ⁺	5614.4	14 ⁺	E2		R(DCO)=0.98 17.
1098		13942	(32 ⁺)	12844	(30 ⁺)	(E2)		
1119.5		12844	(30 ⁺)	11725	(28 ⁺)	(E2)		
1136.0	5	7350.9	18 ⁺	6214.9	16 ⁺			
1162.2	17	5614.4	14 ⁺	4452.1	12 ⁺	E2		R(DCO)=1.07 18.
1183.2	6	6671.2	16 ⁺	5488.1	14 ⁺	E2		R(DCO)=1.1 4.
1216.6	9	6704.6	16 ⁺	5488.1	14 ⁺	E2		R(DCO)=1.09 24.
1337.6	2	6825.8	16 ⁺	5488.1	14 ⁺	(E2)		
1521.0	9	4955.2	12 ⁺	3434.3	10 ⁺	E2		

[†] Intensities for γ rays below the 10⁺ isomer were not reported. Uncertainties are around 10%–20% for stronger peaks and larger than 30% for weak/contaminated peaks. I_γ is given relative to $I(1018 \gamma)=100$.

[‡] From level scheme in Fig. 1; not listed in Table 1 of 1994Rz01.

[#] R(DCO) obtained by gating on $\Delta I=2$, 1018 γ , unless noted.

[@] R(DCO) obtained by gating on $\Delta I=1$, 712 γ .

[&] From R(DCO) values and expectations of $N=80$ nuclei.

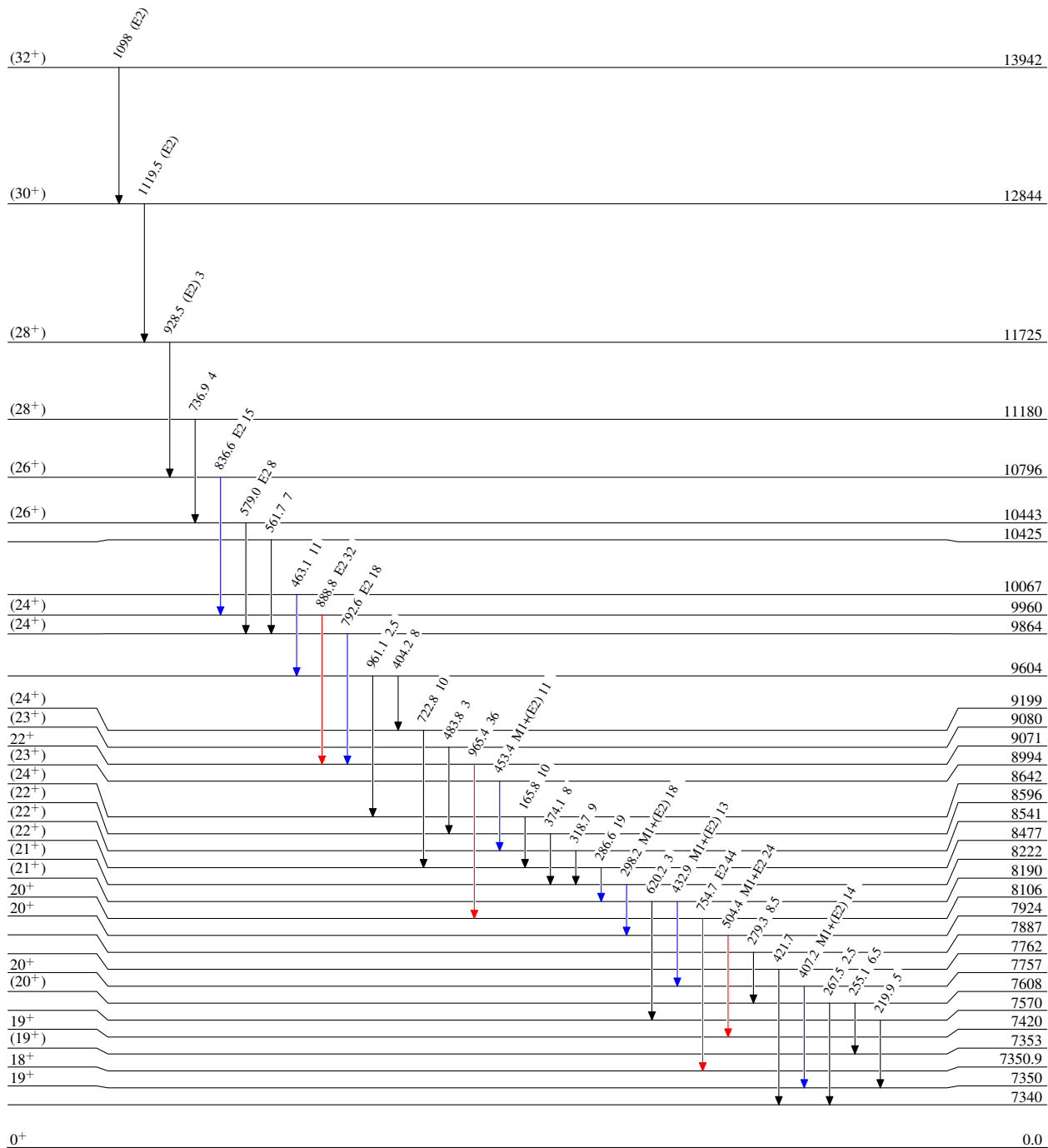
$^{108}\text{Pd}(^{40}\text{Ar},4n\gamma)$ 1994Rz01

Level Scheme

Intensities: Type not specified

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$






$^{144}_{64}\text{Gd}_{80}$

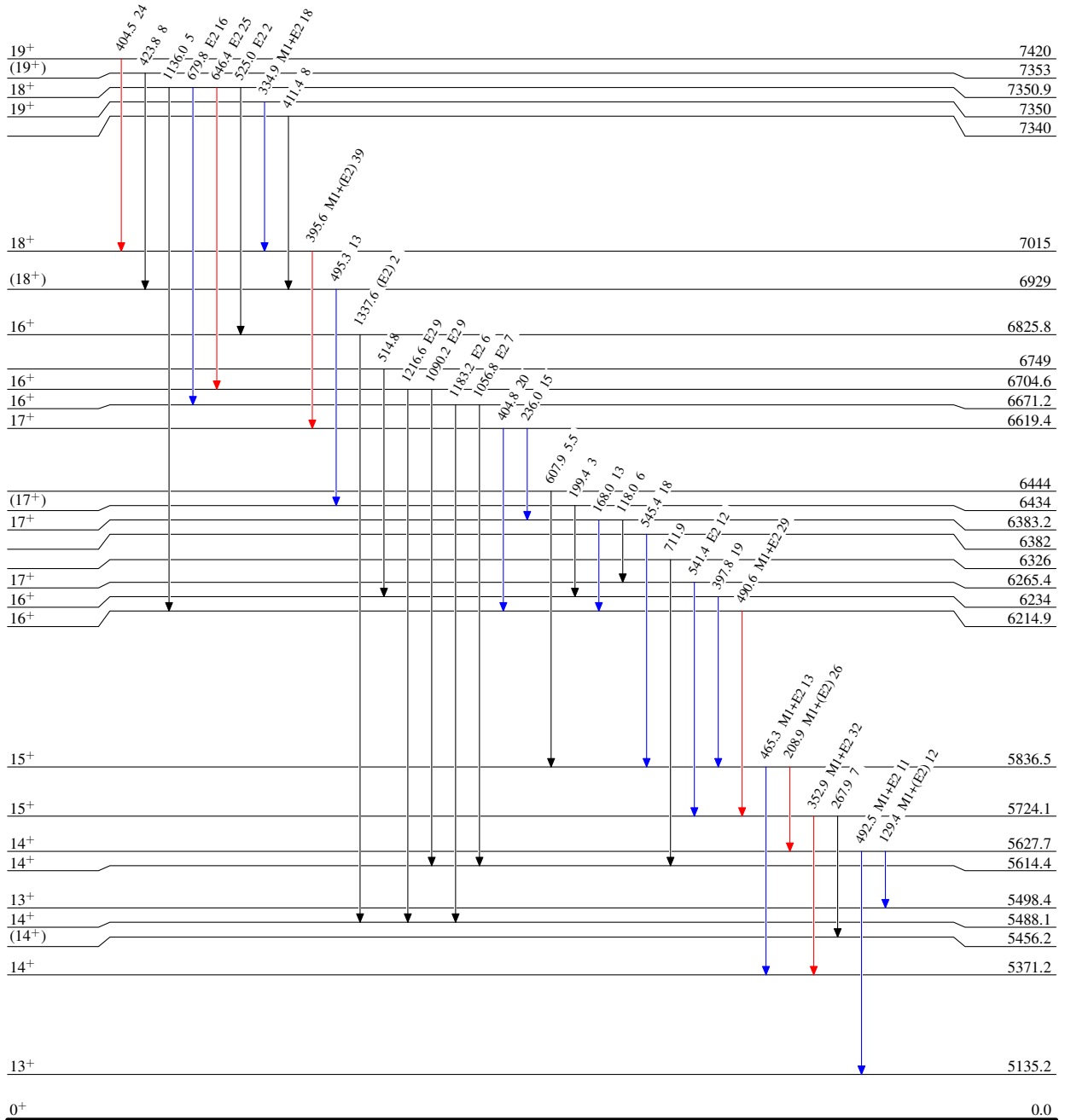
$^{108}\text{Pd}(^{40}\text{Ar},4n\gamma)$ 1994Rz01

Level Scheme (continued)

Intensities: Type not specified

Legend

-  $I_\gamma < 2\% \times I_\gamma^{max}$
-  $I_\gamma < 10\% \times I_\gamma^{max}$
-  $I_\gamma > 10\% \times I_\gamma^{max}$






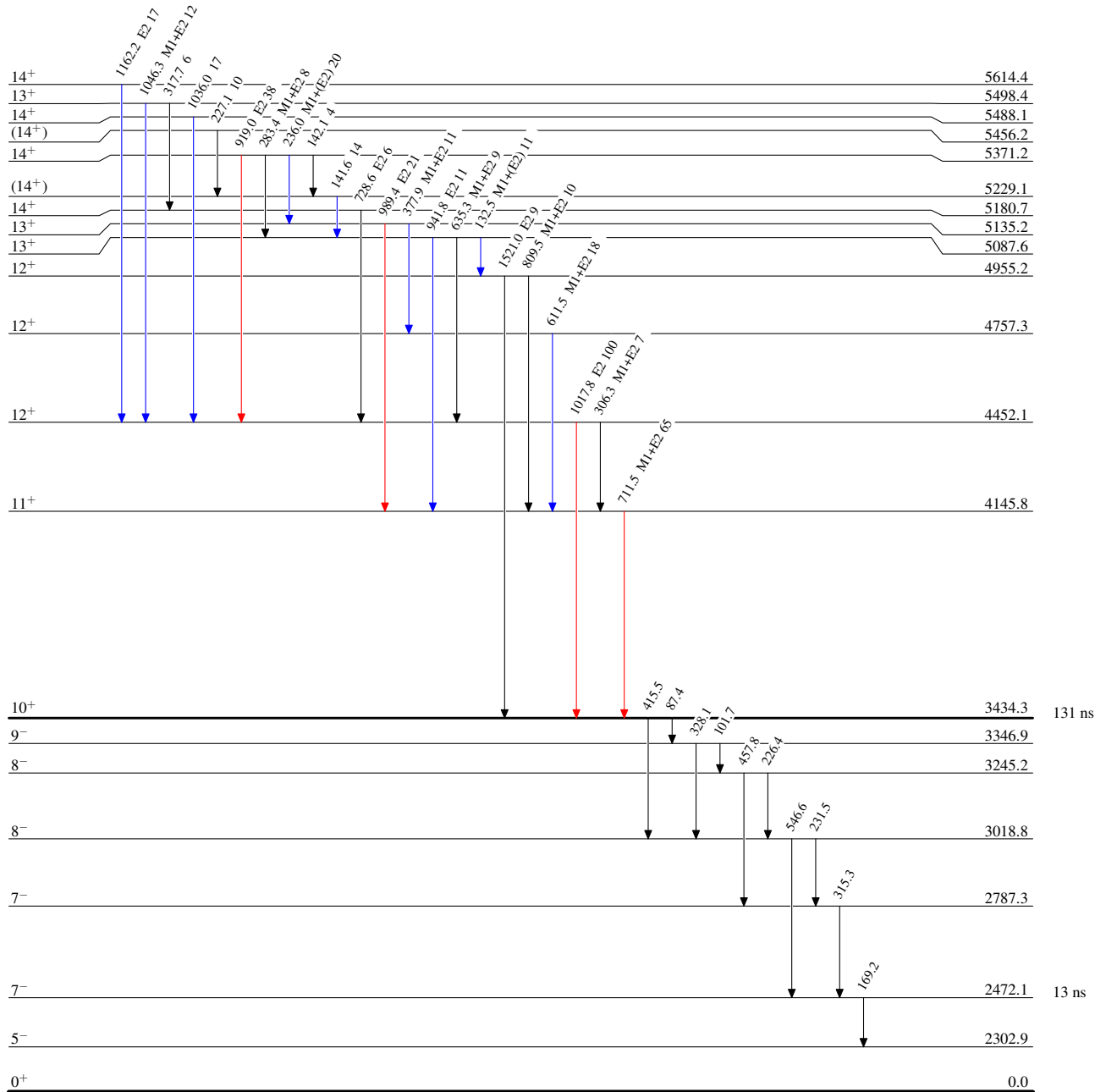
$^{108}\text{Pd}(^{40}\text{Ar},4n\gamma)$ 1994Rz01

Level Scheme (continued)

Intensities: Type not specified

Legend

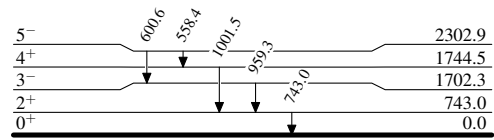
-  $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
 $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
 $I_\gamma > 10\% \times I_\gamma^{\text{max}}$

 $^{144}_{64}\text{Gd}_{80}$

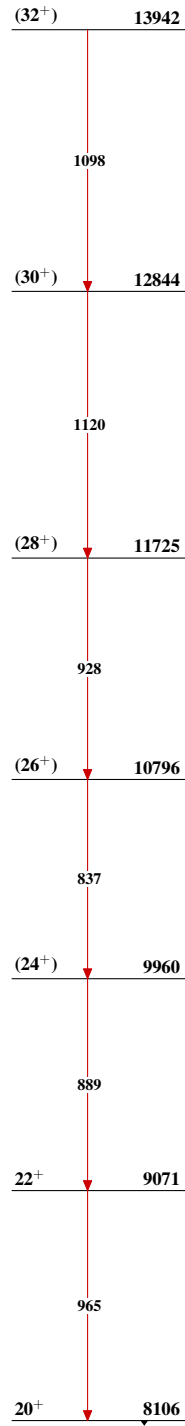
$^{108}\text{Pd}^{(40}\text{Ar},4n\gamma)$ 1994Rz01

Level Scheme (continued)

Intensities: Type not specified



$^{144}_{64}\text{Gd}_{80}$

$^{108}\text{Pd}(^{40}\text{Ar},4\text{n}\gamma)$ 1994Rz01Band(A): Positive parity
band $^{144}_{64}\text{Gd}_{80}$