^{75}As(n,γ) E=2,24 keV   1990Ho10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Measured primary γ rays.

J^{π}(^{75}As g.s.)=3/2$^-$.

Neutron resonances have been studied by 1980Ko17, 1973LiYV, 1969Ju01, 1965Ne08, 1964Ju02, 1964Ga08, 1964Ap01, 1962Ju02 and 1961Co14.

Cross section measurements: 1988Ma24 (E≤700 keV).

1990Ho10 deduced J^{π} values of populated levels from a comparison of observed Iγ/(Eγ^5) and the expected reduced intensities for E1 and M1 transitions for J^{π}=0$^+$ to 3$^+$ and 0$^-$ to 4$^-$. The capture state has J^{π}=1$^-$, 2$^-$ for s-wave and 0$^+$ to 3$^+$ for p-wave neutrons. J^{π}=4$^+$ is also possible for intermediate levels but the reduced intensity is expected to be small. See 1990Ho10 for these J^{π} assignments.

Additional information 1.

^{76}As Levels

E(level)[†]	J$^{\pi}$ [@]	Comments
0.0	2$^-$	
44.03	(1)$^+$	
86.70	1$^+$	
120.85	1$^+$	
164.76	(3)$^-$	
202.91	(0,1)$^+$	
210.00	(4)$^-$	
264.50	1$^+$	
280.32	(1,2)$^+$	
299.92	(2,3$^+$)	
307.92	(2)$^+$	
328.58	(3,4)$^-$	
352.08	(3)$^-$	
363.02	(2$^-$)	
401.79	(1,2)$^+$	
436.06	(1,2,3)$^-$	
446.75	(1,2)$^+$	
456.02	(2$^-$,3$^+$)	
471.04	(2)$^-$	
499.59	(1$^+$,2$^+$)	
505.20	(2,3)$^+$	
517.96	(1$^+$,2$^+$)	
543.75	(2)$^-$	
550.10	(1$^-$,2$^-$)	
609.63	(3$^+$)	
628.29	(1$^+$,2$^+$)	
637.24	(1$^+$,2$^+$)	
668.85	(1$^+$,2$^+$)[&]	
687.03		
703.20		
715.86	(1,2,3)$^+$	
741.60		
744.20	(1$^+$,2$^+$)	
755.87	(0$^+$,3$^+$)[&]	
774.26	(3)$^+$	
787.00	(0,1$^-$,3,4$^-$)[&]	J$^{\pi}$: ≤3$^+$ in Adopted Levels.
793.36	(1,2,3)$^+$	

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^{75}As(n,γ) E=2,24 keV   1990Ho10 (continued)

^{76}As Levels (continued)

E(level)[†]	J$^\pi$ [@]	Comments
801.82	$(1^-,2^-,3^+)$[&]	
861.16	$(1,2,3)^+$[&]	J$^\pi$: 1^+ in Adopted Levels.
894.36	$(1^-,2^-,3^+)$[&]	
908.93	$(1,2)^+$	
926.40	$(\leq 3^-)$	
940.20	$(1,2,3)$[&]	
985.07	$(1,2,3)^+$	
1021.26	$(1^+,2^+)$[&]	
1028.28	$(1^+,2^+)$[&]	
1032.25	$(1,2,3)^+$[&]	J$^\pi$: 1^+ in Adopted Levels.
1063.04	$(1^+,2^+)$[&]	J$^\pi$: 1^+ in Adopted Levels.
(7330.5[‡])	$(1,2,3^+)$	E(level): S(n)+E(n), where E(n)=2 keV and S(n)=7328.50 *7* (2021Wa16).
		J$^\pi$: s- and/or p-wave capture in $3/2^-$ g.s. of ^{75}As.
(7352.5[#])	$(1,2,3^+)$	E(level): S(n)+E(n), where E(n)=24 keV, S(n)=7328.50 *7* (2021Wa16).
		J$^\pi$: s- and/or p-wave capture in $3/2^-$ g.s. of ^{75}As.

[†] Weighted average of values from E(n)=2 keV and E(n)=24 keV. Uncertainties are not given by 1990Ho10, but are expected to be 0.2 to 1.0 keV, when compared with values from (n,γ),E=thermal.

[‡] S(n)=7328.50 *7* (2021Wa16), E(n)=2 keV average neutron energy. 7329.37 *3* from least-squares fit to primary γ rays in (n,γ),E=2 keV and level energies from (n,γ),E=thermal. This gives E(n)=0.83 keV.

[#] S(n)=7328.50 *7* (2021Wa16), E(n)=24 keV average neutron energy. 7350.80 *5* from least-squares fit to primary γ rays in (n,γ),E=24 keV and level energies from (n,γ),E=thermal. This gives E(n)=22.3 keV.

[@] From the Adopted Levels, except when stated otherwise. See also 1990Ho10 for additional possible J$^\pi$ values.

[&] From 1990Ho10, based on comparison of experimental reduced transition intensities with theoretical values.

γ(^{76}As)

E$_\gamma$[†]	I$_\gamma$[‡]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
6266.1 *2*	347 *14*	(7330.5)	$(1,2,3^+)$	1063.04	$(1^+,2^+)$
6287.5 *3*	168 *12*	(7352.5)	$(1,2,3^+)$	1063.04	$(1^+,2^+)$
6296.2 *4*	273 *27*	(7330.5)	$(1,2,3^+)$	1032.25	$(1,2,3)^+$
6301.3 *8*	202 *26*	(7330.5)	$(1,2,3^+)$	1028.28	$(1^+,2^+)$
6307.8 *2*	733 *22*	(7330.5)	$(1,2,3^+)$	1021.26	$(1^+,2^+)$
6318.9 *4*	210 *19*	(7352.5)	$(1,2,3^+)$	1032.25	$(1,2,3)^+$
6321.9 *6*	134 *18*	(7352.5)	$(1,2,3^+)$	1028.28	$(1^+,2^+)$
6329.7 *4*	178 *18*	(7352.5)	$(1,2,3^+)$	1021.26	$(1^+,2^+)$
6344.1 *1*	500 *20*	(7330.5)	$(1,2,3^+)$	985.07	$(1,2,3)^+$
6367.0 *7*	64 *13*	(7352.5)	$(1,2,3^+)$	985.07	$(1,2,3)^+$
6390.2 *5*	391[#] *51*	(7330.5)	$(1,2,3^+)$	940.20	$(1,2,3)$
6407.1 *6*	88 *18*	(7330.5)	$(1,2,3^+)$	926.40	$(\leq 3^-)$
6412.4 *5*	102 *14*	(7352.5)	$(1,2,3^+)$	940.20	$(1,2,3)$
6420.2 *3*	188 *15*	(7330.5)	$(1,2,3^+)$	908.93	$(1,2)^+$
6433.5 *9*	86 *22*	(7330.5)	$(1,2,3^+)$	894.36	$(1^-,2^-,3^+)$
6441.5 *2*	153 *11*	(7352.5)	$(1,2,3^+)$	908.93	$(1,2)^+$
6456.3 *4*	88 *10*	(7352.5)	$(1,2,3^+)$	894.36	$(1^-,2^-,3^+)$
6466.3 *9*	1164[#] *23*	(7330.5)	$(1,2,3^+)$	861.16	$(1,2,3)^+$
6490.3 *7*	108 *24*	(7352.5)	$(1,2,3^+)$	861.16	$(1,2,3)^+$
6527.5 *5*	85 *10*	(7330.5)	$(1,2,3^+)$	801.82	$(1^-,2^-,3^+)$
6535.8 *2*	376 *13*	(7330.5)	$(1,2,3^+)$	793.36	$(1,2,3)^+$

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^{75}As(n,γ) E=2,24 keV   **1990Ho10** (continued)

$\gamma({}^{76}$As) (continued)

$E_\gamma{}^\dagger$	$I_\gamma{}^\ddagger$	E_i(level)	J_i^π	E_f	J_f^π
6543.7 *1*	433${}^{\#}$ *17*	(7330.5)	(1,2,3${}^+$)	787.00	(0,1${}^-$,3,4${}^-$)
6548.5 *4*	93 *8*	(7352.5)	(1,2,3${}^+$)	801.82	(1${}^-$,2${}^-$,3${}^+$)
6555.0 *2*	205 *14*	(7330.5)	(1,2,3${}^+$)	774.26	(3)${}^+$
6557.2 *4*	85 *9*	(7352.5)	(1,2,3${}^+$)	793.36	(1,2,3)${}^+$
6565.3 *6*	55 *8*	(7352.5)	(1,2,3${}^+$)	787.00	(0,1${}^-$,3,4${}^-$)
6573.3 *3*	156 *13*	(7330.5)	(1,2,3${}^+$)	755.87	(0${}^+$,3${}^+$)
6575.8 *5*	57 *9*	(7352.5)	(1,2,3${}^+$)	774.26	(3)${}^+$
6584.5 *3*	356 *29*	(7330.5)	(1,2,3${}^+$)	744.20	(1${}^+$,2${}^+$)
6588.9 *9*	80 *27*	(7330.5)	(1,2,3${}^+$)	741.60	
6594.6 *5*	61 *10*	(7352.5)	(1,2,3${}^+$)	755.87	(0${}^+$,3${}^+$)
6606.7 *3*	154 *11*	(7352.5)	(1,2,3${}^+$)	744.20	(1${}^+$,2${}^+$)
6613.2 *4*	79 *9*	(7330.5)	(1,2,3${}^+$)	715.86	(1,2,3)${}^+$
6626.7 *4*	80 *6*	(7330.5)	(1,2,3${}^+$)	703.20	
6635.1 *8*	28 *6*	(7352.5)	(1,2,3${}^+$)	715.86	(1,2,3)${}^+$
6642.1 *2*	189 *10*	(7330.5)	(1,2,3${}^+$)	687.03	
6646.8 *3*	76 *7*	(7352.5)	(1,2,3${}^+$)	703.20	
6660.3 *2*	217 *11*	(7330.5)	(1,2,3${}^+$)	668.85	(1${}^+$,2${}^+$)
6664.0 *6*	43 *7*	(7352.5)	(1,2,3${}^+$)	687.03	
6681.6 *2*	225 *9*	(7352.5)	(1,2,3${}^+$)	668.85	(1${}^+$,2${}^+$)
6691.9 *1*	611${}^{\#}$ *18*	(7330.5)	(1,2,3${}^+$)	637.24	(1${}^+$,2${}^+$)
6700.6 *2*	308 *15*	(7330.5)	(1,2,3${}^+$)	628.29	(1${}^+$,2${}^+$)
6715.9 *7*	126 *17*	(7352.5)	(1,2,3${}^+$)	637.24	(1${}^+$,2${}^+$)
6719.2 *4*	113 *12*	(7330.5)	(1,2,3${}^+$)	609.63	(3${}^+$)
6722.8 *3*	179 *13*	(7352.5)	(1,2,3${}^+$)	628.29	(1${}^+$,2${}^+$)
6741.6 *6*	44 *8*	(7352.5)	(1,2,3${}^+$)	609.63	(3${}^+$)
6779.0 *4*	94 *9*	(7330.5)	(1,2,3${}^+$)	550.10	(1${}^-$,2${}^-$)
6785.3 *4*	107 *10*	(7330.5)	(1,2,3${}^+$)	543.75	(2)${}^-$
6800.4 *4*	79 *8*	(7352.5)	(1,2,3${}^+$)	550.10	(1${}^-$,2${}^-$)
6806.8 *4*	80 *8*	(7352.5)	(1,2,3${}^+$)	543.75	(2)${}^-$
6811.0 *1*	511 *15*	(7330.5)	(1,2,3${}^+$)	517.96	(1${}^+$,2${}^+$)
6824.0 *5*	144 *17*	(7330.5)	(1,2,3${}^+$)	505.20	(2,3)${}^+$
6829.5 *3*	291 *18*	(7330.5)	(1,2,3${}^+$)	499.59	(1${}^+$,2${}^+$)
6833.4 *2*	209 *11*	(7352.5)	(1,2,3${}^+$)	517.96	(1${}^+$,2${}^+$)
6845.2 *4*	114 *9*	(7352.5)	(1,2,3${}^+$)	505.20	(2,3)${}^+$
6851.0 *4*	104 *9*	(7352.5)	(1,2,3${}^+$)	499.59	(1${}^+$,2${}^+$)
6858.0 *2*	304${}^{\#}$ *12*	(7330.5)	(1,2,3${}^+$)	471.04	(2)${}^-$
6873.1 *6*	63 *9*	(7330.5)	(1,2,3${}^+$)	456.02	(2${}^-$,3${}^+$)
6880.0 *4*	64 *6*	(7352.5)	(1,2,3${}^+$)	471.04	(2)${}^-$
6882.0 *2*	260 *13*	(7330.5)	(1,2,3${}^+$)	446.75	(1,2)${}^+$
6892.8 *7*	44 *9*	(7330.5)	(1,2,3${}^+$)	436.06	(1,2,3)${}^-$
6894.4 *3*	95 *7*	(7352.5)	(1,2,3${}^+$)	456.02	(2${}^-$,3${}^+$)
6904.1 *2*	155 *6*	(7352.5)	(1,2,3${}^+$)	446.75	(1,2)${}^+$
6914.4 *3*	64 *6*	(7352.5)	(1,2,3${}^+$)	436.06	(1,2,3)${}^-$
6927.4 *1*	388 *12*	(7330.5)	(1,2,3${}^+$)	401.79	(1,2)${}^+$
6948.7 *3*	99 *8*	(7352.5)	(1,2,3${}^+$)	401.79	(1,2)${}^+$
6965.7 *3*	94 *7*	(7330.5)	(1,2,3${}^+$)	363.02	(2${}^-$)
6977.1 *2*	120 *6*	(7330.5)	(1,2,3${}^+$)	352.08	(3)${}^-$
6988.7 *5*	84 *13*	(7352.5)	(1,2,3${}^+$)	363.02	(2${}^-$)
6998.4 *4*	52 *5*	(7352.5)	(1,2,3${}^+$)	352.08	(3)${}^-$
7002.6 *9*	23 *6*	(7330.5)	(1,2,3${}^+$)	328.58	(3,4)${}^-$
7021.1 *2*	270 *11*	(7330.5)	(1,2,3${}^+$)	307.92	(2)${}^+$
7021.8 *1*	19 *6*	(7352.5)	(1,2,3${}^+$)	328.58	(3,4)${}^-$
7029.1 *3*	119 *10*	(7330.5)	(1,2,3${}^+$)	299.92	(2,3${}^+$)
7042.9 *3*	114 *8*	(7352.5)	(1,2,3${}^+$)	307.92	(2)${}^+$
7048.9 *1*	399 *12*	(7330.5)	(1,2,3${}^+$)	280.32	(1,2)${}^+$

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^{75}As(n,γ) E=2,24 keV   1990Ho10 (continued)

$\gamma(^{76}$As) (continued)
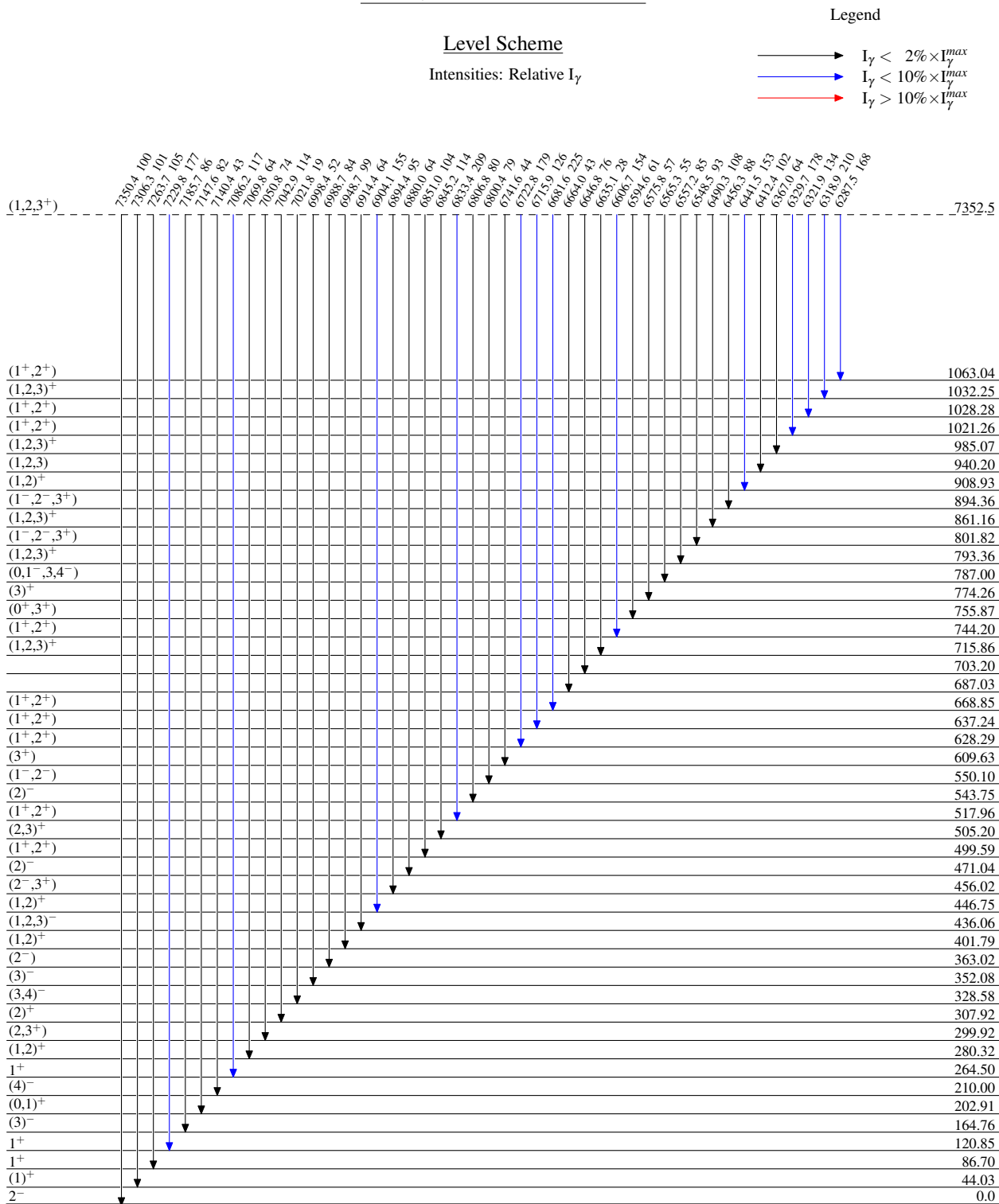
$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_i(level)	J_i^π	E_f	J_f^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_i(level)	J_i^π	E_f	J_f^π
7050.8 4	74 7	(7352.5)	$(1,2,3^+)$	299.92	$(2,3^+)$	7185.7 2	86 4	(7352.5)	$(1,2,3^+)$	164.76	$(3)^-$
7064.4 2	281 11	(7330.5)	$(1,2,3^+)$	264.50	1^+	7208.1 2	363 14	(7330.5)	$(1,2,3^+)$	120.85	1^+
7069.8 4	64 6	(7352.5)	$(1,2,3^+)$	280.32	$(1,2)^+$	7229.8 2	177 9	(7352.5)	$(1,2,3^+)$	120.85	1^+
7086.2 2	117 7	(7352.5)	$(1,2,3^+)$	264.50	1^+	7242.5 1	596 12	(7330.5)	$(1,2,3^+)$	86.70	1^+
7119.2 7	32 5	(7330.5)	$(1,2,3^+)$	210.00	$(4)^-$	7263.7 2	105 6	(7352.5)	$(1,2,3^+)$	86.70	1^+
7126.1 4	63 6	(7330.5)	$(1,2,3^+)$	202.91	$(0,1)^+$	7285.2 2	269 14	(7330.5)	$(1,2,3^+)$	44.03	$(1)^+$
7140.4 5	43 7	(7352.5)	$(1,2,3^+)$	210.00	$(4)^-$	7306.3 3	101 6	(7352.5)	$(1,2,3^+)$	44.03	$(1)^+$
7147.6 3	82 6	(7352.5)	$(1,2,3^+)$	202.91	$(0,1)^+$	7329.2 2	100 5	(7330.5)	$(1,2,3^+)$	0.0	2^-
7164.3 3	86 7	(7330.5)	$(1,2,3^+)$	164.76	$(3)^-$	7350.4 2	100 6	(7352.5)	$(1,2,3^+)$	0.0	2^-

† The values given by 1990Ho10 are most likely recoil corrected. The uncertainties are statistical only.

‡ $I\gamma/(E\gamma^5)$, normalized to 100 for primary γ to g.s.

$^\#$ Line partly obscured by an impurity.

^{75}As(n,γ) E=2,24 keV   1990Ho10

Level Scheme

Intensities: Relative I$_\gamma$

Legend

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
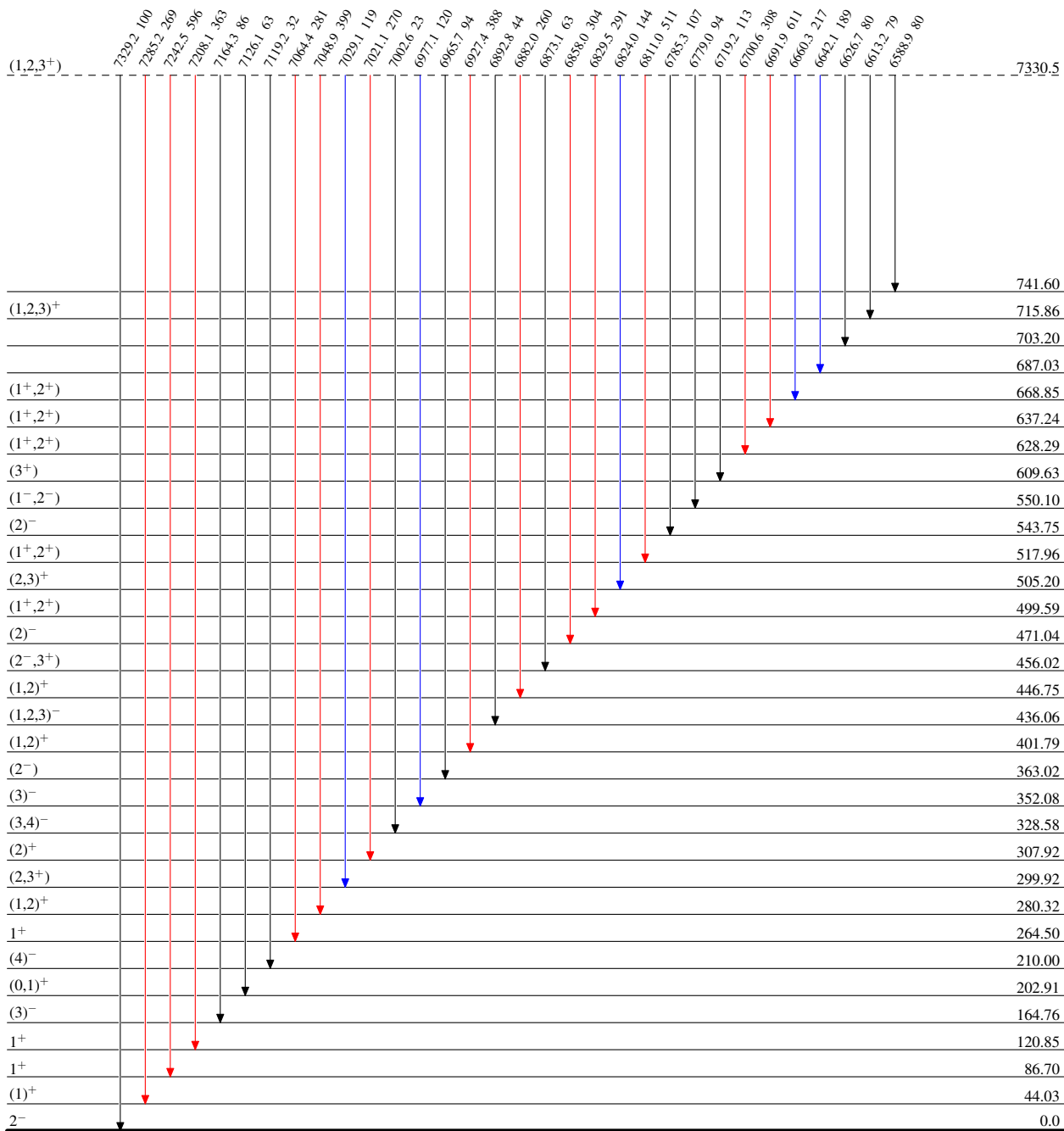I$_\gamma$ > 10%×I$_\gamma^{max}$

$^{76}_{33}$As$_{43}$

^{75}As(n,γ) E=2,24 keV   1990Ho10

Level Scheme (continued)

Intensities: Relative I$_\gamma$

Legend

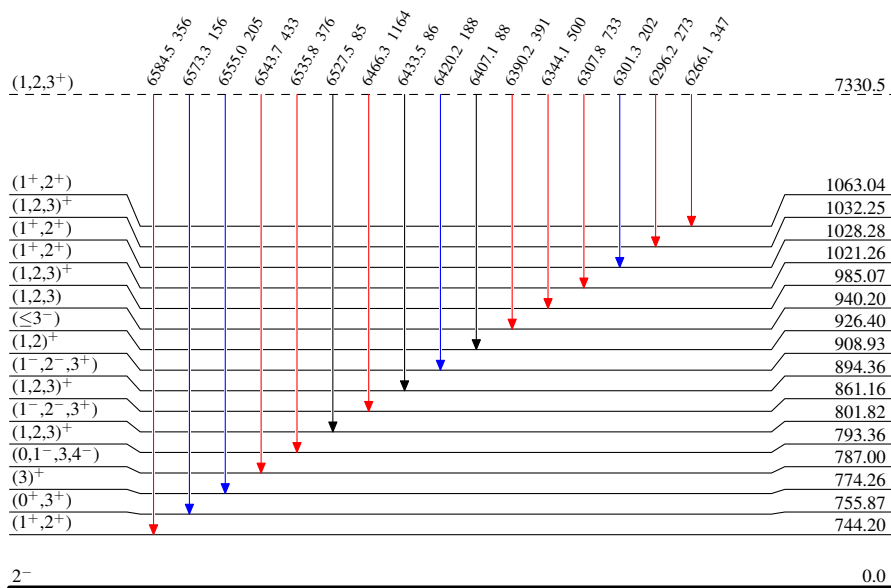$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$

$^{76}_{33}$As$_{43}$

^{75}As(n,γ) E=2,24 keV   1990Ho10

Level Scheme (continued)

Intensities: Relative I$_\gamma$

Legend

I$_\gamma$ < 2%×I$_\gamma^{max}$
I$_\gamma$ < 10%×I$_\gamma^{max}$
I$_\gamma$ > 10%×I$_\gamma^{max}$

$^{76}_{33}$As$_{43}$