^{239}Pu(n,γ) E=2 keV 1985Ch08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, E. Browne	NDS 109, 2439 (2008)	31-Jul-2008

1985Ch08: measured Eγ, Iγ. Deduced strength functions.
Other measurements: 1972OtZZ, 1975WeZA.
Additional information 1.

^{240}Pu Levels

E(level)[†]	J$^{\pi}$[‡]	Comments
0	0^+	
42.8	2^+	
597.4	1^-	
860.7	0^+	
900.3	2^+	
938.1	1^-	
958.9	2^-	
1089.4	0^+	
1130.9	2^+	
1136.9	2^+	
1180.4	2^+	
1222.9	$1^+,2^+$[@]	
1240.7	2^-	
1410.8	$0^{(-)}$	
1413.0	$^+$	
1438.5	$2^{(-)}$	
1488.1	1^-[&]	
1525.9	0^+	
1539.7	1^-	
1558.9	2^+	
1607.8	1^-	
1626.7	1^-[&]	
1633.4	1^-[&]	
1710.5	2^+	
1775.3	1^-	
1796.3	1^-[&]	
1918.0	$^-$[a]	
2127.4	$^-$	
(S(n)+2)	1^+[#]	E(level): S(n)=6534.20 *23* (2003Au03), E(n)=2 keV.

[†] Rounded values from 'Adopted Levels'.

[‡] The assignments are based on the average resonance capture data and coupled with empirical reduced intensity to final states with known J^{π} values (see 1985Ch08). The assignments are the same in 'Adopted Levels', except that above 950 KEV, some are placed in parentheses due to lack of strong arguments and there are some discrepancies which are pointed out.

[#] Since the target ^{239}Pu has J^{π}=1/2$^+$, both J^{π}=1$^+$ and 0$^+$ resonances would be expected for s-wave capture. As pointed out by 1985Ch08, the large fission Γ for J=0 channel relative to the J=1 channel effectively suppresses the J=0 channel for radiative decay.

[@] (2$^+$) in 'Adopted Levels'.

[&] (1,2$^+$) in 'Adopted Levels'.

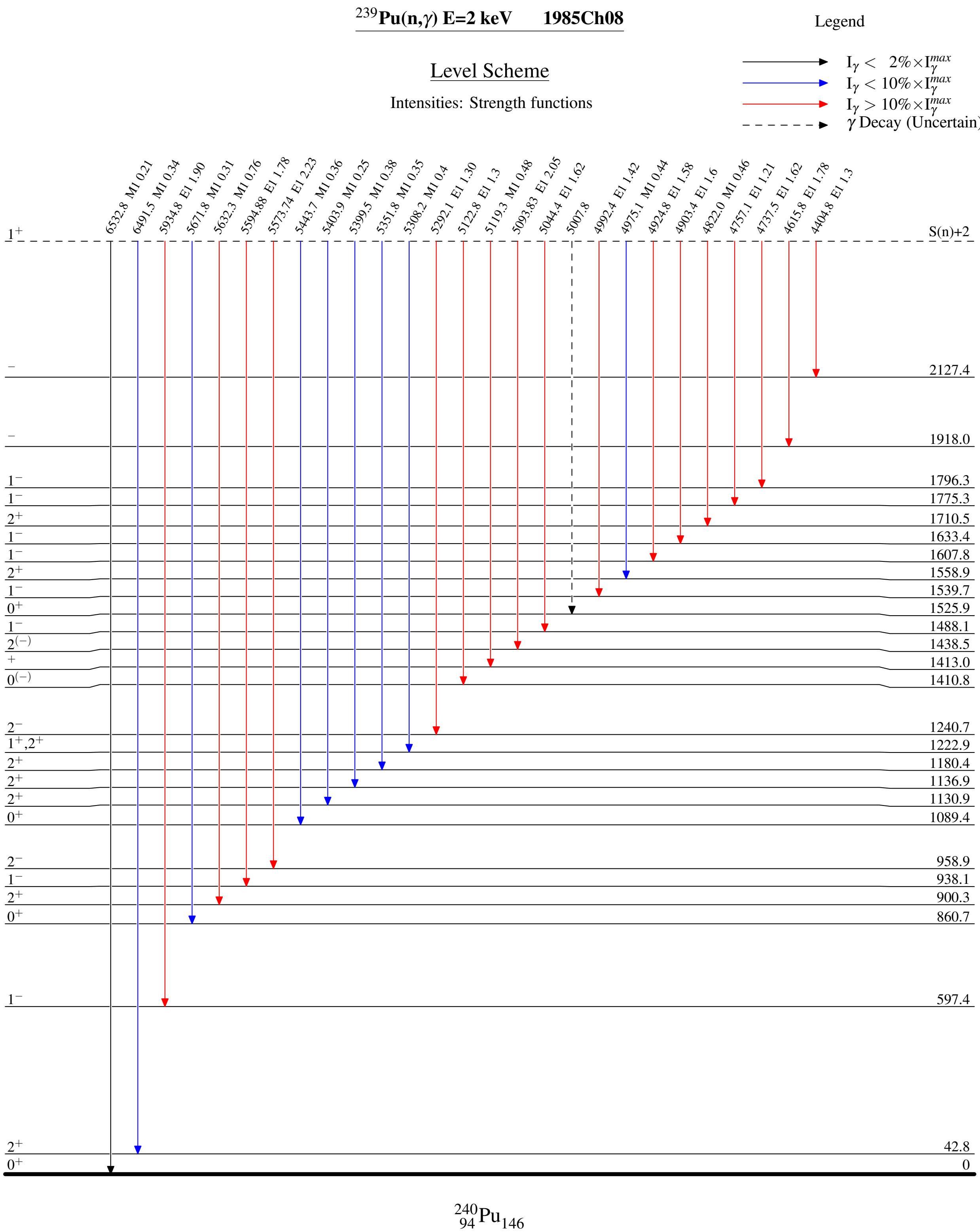
[a] (1$^-$) in 'Adopted Levels'.

^{239}Pu(n,γ) E=2 keV 1985Ch08 (continued)

γ(^{240}Pu)

$E_γ$ ‡	strength function #	E_i(level)	$J_i^π$	E_f	$J_f^π$	Mult. †
4404.8 *7*	1.3 *4*	(S(n)+2)	1+	2127.4	−	E1
4615.8 *3*	1.78 *26*	(S(n)+2)	1+	1918.0	−	E1
4737.5 *4*	1.62 *24*	(S(n)+2)	1+	1796.3	1−	E1
4757.1 *6*	1.21 *26*	(S(n)+2)	1+	1775.3	1−	E1
4822.0 *12*	0.46 *26*	(S(n)+2)	1+	1710.5	2+	M1
4899.4 *9*	1.3 *5*	(S(n)+2)	1+			E1
4903.4 *14*	1.6 *5*	(S(n)+2)	1+	1633.4	1−	E1
4924.8 *3*	1.58 *21*	(S(n)+2)	1+	1607.8	1−	E1
4975.1 *6*	0.44 *20*	(S(n)+2)	1+	1558.9	2+	M1
4992.4 *3*	1.42 *20*	(S(n)+2)	1+	1539.7	1−	E1
5007.8 @		(S(n)+2)	1+	1525.9	0+	
5044.4 *3*	1.62 *19*	(S(n)+2)	1+	1488.1	1−	E1
5093.83 *20*	2.05 *18*	(S(n)+2)	1+	1438.5	2(−)	E1
5119.3 *10*	0.48 *25*	(S(n)+2)	1+	1413.0	+	M1
5122.8 *7*	1.3 *4*	(S(n)+2)	1+	1410.8	0(−)	E1
5292.1 *3*	1.30 *14*	(S(n)+2)	1+	1240.7	2−	E1
5308.2 *19*	0.4 *3*	(S(n)+2)	1+	1222.9	1+,2+	M1
5351.8 *7*	0.35 *14*	(S(n)+2)	1+	1180.4	2+	M1
5399.5 *8*	0.38 *13*	(S(n)+2)	1+	1136.9	2+	M1
5403.9 *7*	0.25 *6*	(S(n)+2)	1+	1130.9	2+	M1
5443.7 *16*	0.36 *23*	(S(n)+2)	1+	1089.4	0+	M1
5573.74 *13*	2.23 *14*	(S(n)+2)	1+	958.9	2−	E1
5594.88 *16*	1.78 *13*	(S(n)+2)	1+	938.1	1−	E1
5632.3 *3*	0.76 *11*	(S(n)+2)	1+	900.3	2+	M1
5671.8 *13*	0.31 *18*	(S(n)+2)	1+	860.7	0+	M1
5934.8 *2*	1.90 *15*	(S(n)+2)	1+	597.4	1−	E1
6491.5 *9*	0.34 *12*	(S(n)+2)	1+	42.8	2+	M1
6532.8 *5*	0.21 *6*	(S(n)+2)	1+	0	0+	M1

† From 1972OtZZ.
‡ 1985Ch08 corrected for 2-keV kinematical shift to make them equivalent to Eγ from thermal capture.
# In units of 10^{-7} MeV^{-3}.
@ Placement of transition in the level scheme is uncertain.



239Pu(n,γ) E=2 keV 1985Ch08
Level Scheme
Intensities: Strength functions
Legend
Iγ < 2%×Iγmax
Iγ < 10%×Iγmax
Iγ > 10%×Iγmax
γ Decay (Uncertain)
6532.8 M1 0.21
6491.5 M1 0.34
5934.8 E1 1.90
5671.8 M1 0.31
5632.3 M1 0.76
5594.88 E1 1.78
5573.74 E1 2.23
5443.7 M1 0.36
5403.9 M1 0.25
5399.5 M1 0.38
5351.8 M1 0.35
5308.2 M1 0.4
5292.1 E1 1.30
5122.8 E1 1.3
5119.3 M1 0.48
5093.83 E1 2.05
5044.4 E1 1.62
5007.8
4992.4 E1 1.42
4975.1 M1 0.44
4924.8 E1 1.58
4903.4 E1 1.6
4822.0 M1 0.46
4757.1 E1 1.21
4737.5 E1 1.62
4615.8 E1 1.78
4404.8 E1 1.3
1+ S(n)+2
− 2127.4
− 1918.0
1− 1796.3
1− 1775.3
2+ 1710.5
1− 1633.4
1− 1607.8
2+ 1558.9
1− 1539.7
0+ 1525.9
1− 1488.1
2(−) 1438.5
+ 1413.0
0(−) 1410.8
2− 1240.7
1+,2+ 1222.9
2+ 1180.4
2+ 1136.9
2+ 1130.9
0+ 1089.4
2− 958.9
1− 938.1
2+ 900.3
0+ 860.7
1− 597.4
2+ 42.8
0+ 0
240/94Pu146