$^{238}U(p,2n\gamma)$ 1990St29

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia	NDS 107, 3323 (2006)	15-Mar-2006

Target: ^{238}U; Projectile: Pulsed p beams of E=12.6 MeV, Detector:

^{237}Np Levels

E(level)†	J^{π}‡	$T_{1/2}$	Comments
0.0#	5/2+		
33.1964# *3*	7/2+		
59.5412@ *1*	5/2−		
75.92# *4*	9/2+		
102.96@ *2*	7/2−		
130.00# *3*	11/2+		
158.51@ *2*	9/2−		
191.46# *8*	13/2+		
225.96@ *2*	11/2−		
269.9# *5*	15/2+		
305.06@ *4*	13/2−		
945.3 *3*	11/2, 13/2	0.71 μs *4*	The authors of 1990St29 calculated Weisskopf hindrance factors for the transition deexciting the 945.3-keV level by assuming various multipolarities. From the systematics of transition probabilities and the expected orbitals, 1990St29 propose the following possible three-quasiparticle configurations: J^{π}=13/2+: p 5/2[642]+ p 5/2]523]+ p 3/2[521], 13/2−: p 5/2[642]+ p 5/2[523]+ p 3/2[651], 13/2−: p 5/2[642]+ p 7/2[633]+ p 1/2[530], 13/2+: p 5/2[642]+ p 7/2[633]+ p 1/2[400], 13/2−: p 5/2[642]+ n 7/2[743]+ n 1/2[631], 13/2+: p 5/2[642]+ n 7/2[642]+ n 1/2[631], 11/2−: p 11/2[505]. Among the three-quasiparticle configurations, the fifth and the first configurations in the list with J^{π}=13/2− and 13/2+ are favored by considering the expected excitation energies of the orbitals (1990St29). In addition to orbital energies, by assuming that the neutron pairing energy is smaller than the proton pairing, suggest that between these two configurations, the one proton+two neutron configuration with J^{π}=13/2− is more probable (1990St29). The authors of 1990St29 point out that the one-quasiparticle state, p 11/2[505] state, could not be excluded; however, this proton orbital has not been observed in any neighboring nuclei; therefore, the energy from systematics for this state is not available.

† From a least squares fit to the γ-ray energies, assuming ΔE=1 keV for all γ-rays.
‡ From rotational band structure, except otherwise noted.
# 5/2[642] band.
@ 5/2[523] band.

$\gamma(^{237}Np)$

E_γ	E_i(level)	J^{π}_i	E_f	J^{π}_f	$I_{(\gamma+ce)}$†
26.3	59.5412	5/2−	33.1964	7/2+	21.9
33.2	33.1964	7/2+	0.0	5/2+	100
42.7	75.92	9/2+	33.1964	7/2+	93.6
43.4	102.96	7/2−	59.5412	5/2−	99.8
54.0	130.00	11/2+	75.92	9/2+	89
55.6	158.51	9/2−	102.96	7/2−	78.2
59.5	59.5412	5/2−	0.0	5/2+	78.1
(61.5‡)	191.46	13/2+	130.00	11/2+	86#
67.5	225.96	11/2−	158.51	9/2−	65.8
69.8	102.96	7/2−	33.1964	7/2+	0.03
75.8	75.92	9/2+	0.0	5/2+	6.4
(78.4‡)	269.9	15/2+	191.46	13/2+	82#

Continued on next page (footnotes at end of table)

$^{238}U(p,2n\gamma)$ 1990St29 (continued)

$\gamma(^{237}Np)$ (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π	$I_{(\gamma+ce)}$ †
96.7	130.00	11/2+	33.1964	7/2+	11
99.0	158.51	9/2−	59.5412	5/2−	21.4
103.0	102.96	7/2−	0.0	5/2+	0.18
115.5	191.46	13/2+	75.92	9/2+	14
123.0	225.96	11/2−	102.96	7/2−	33.8
125.3	158.51	9/2−	33.1964	7/2+	0.3
139.9	269.9	15/2+	130.00	11/2+	18
146.6	305.06	13/2−	158.51	9/2−	98.8
150.0	225.96	11/2−	75.92	9/2+	0.4
175.1	305.06	13/2−	130.00	11/2+	1.2
640.4 *3*	945.3	11/2, 13/2	305.06	13/2−	12.2 *24*
675.6 *4*	945.3	11/2, 13/2	269.9	15/2+	2.0 *4*
719.2 *2*	945.3	11/2, 13/2	225.96	11/2−	15.0 *30*
753.6 *2*	945.3	11/2, 13/2	191.46	13/2+	17.7 *35*
786.8 *2*	945.3	11/2, 13/2	158.51	9/2−	16.4 *33*
815.3 *2*	945.3	11/2, 13/2	130.00	11/2+	36.7 *73*
(842.3‡)	945.3	11/2, 13/2	102.96	7/2−	<4.6
(869.4‡)	945.3	11/2, 13/2	75.92	9/2+	<4.5

† Relative transition intensities depopulating each level, normalized such that their sum is 100 for each level (1990St29).
‡ From level scheme; transition was not observed.
# Calculated in 1990St29 using ALAGA rule. The authors of 1990St29 assume that reduced M1/E2 transitions are constant within the band.

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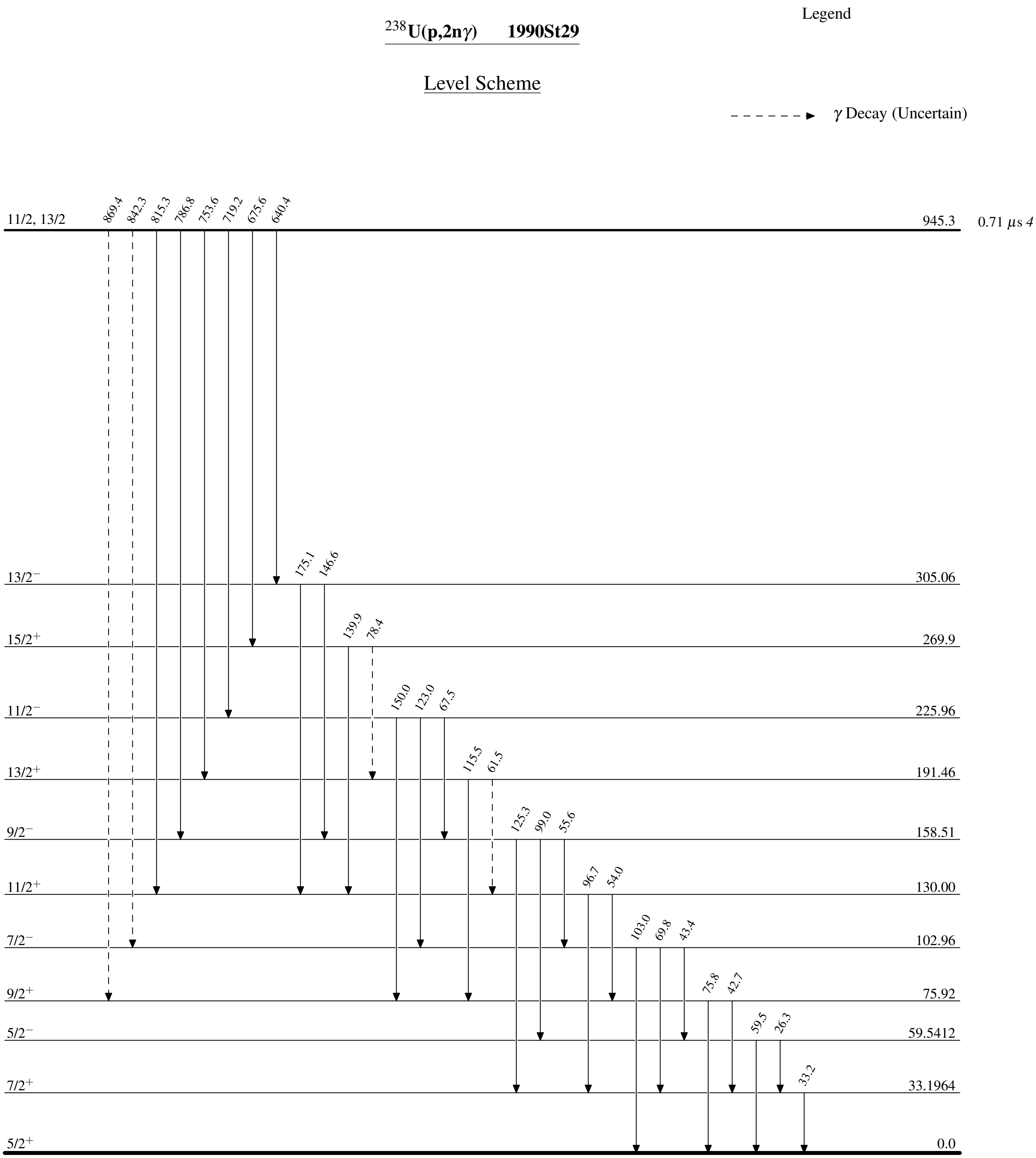
Level Scheme



$^{237}_{93}Np_{144}$