^{86}Nb ε decay (88 s) 1985Wa10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Alexandru Negret, Balraj Singh	NDS 124, 1 (2015)	30-Nov-2014

Parent: ^{86}Nb: E=0; $J^\pi=(6^+)$; $T_{1/2}$=88 s *1*; Q(ε)=8836 *7*; %ε+%β^+ decay=100.0

^{86}Nb-J^π: 5^+ proposed by 1985Wa10 is not supported by in-beam γ-ray measurements (2000DoZV).

The activities studied by 1985Wa10 and 1994Sh07 may be composed of at least two isomers of ^{86}Nb: one of the isomers is the known 88-s activity ($J^\pi=(6^+)$), the other may be a low-spin isomer which may feed low-spin states in ^{86}Zr. Since the 56-s isomer has not been confirmed in more recent studies of 1997Ta10 (2000DoZV) and 2005Ka39, evaluators assume that the main activity is from 88-s, (6^+) ^{86}Nb decay, although, contribution from a possible isomer in ^{86}Nb is possible.

1985Wa10: Source produced by ^{58}Ni(^{32}S,3pnγ). Measured Eγ, Iγ, (x ray)γ(t)), $\gamma\gamma$(t), $\beta\gamma$(t).

1994Sh07 report another ^{86}Nb ε decay (56.3 s). Source produced by ^{54}Fe(^{35}Cl,2pnγ), E=103 MeV; (x ray)γ coin gated on the 752, 914 and 1003 keV γ rays and decay curve.

Others: 1977Ko05, 1982De43, 1974Vo03.

Comments from 2000DoZV indicate studies of ^{86}Nb decay to ^{86}Zr are in progress. Some preliminary conclusions are listed in this note. Among which the author suggests observing 50 additional transitions in this decay, some of these populate high spin states such as 3272, 6^-; 3424 and 3647, both 7^-; 3298 and 3533, both 8^+. Although details of this study are not available, it would seem, however, that the level scheme is much more complex than that proposed by 1985Wa10. For this reason, %ε+%β^+ feedings and associated log *ft* values (as given by 1985Wa10) were not reproduced here. In addition there is still a large gap between the Q-value and the top excitation energy known from the study of 1985Wa10. Contribution from possible different isomers of ^{86}Nb (although only one is firmly established so far, but at least one other low-spin isomer is also expected) would further complicate the issue.

The decay scheme is incomplete since many transitions remain unobserved or unreported. No normalization can be meaningfully done.

^{86}Zr Levels

E(level)†	J^π‡	Comments
0.0	0^+	
751.74 *3*	2^+	
1421.76 *5*	(2^+)	
1666.55 *6*	4^+	
2041.89 *9*	$(0^+$ to $4^+)$	
2343.73 *7*	$(4^+,3^-)$	
2669.85 *7*	6^+	
2706.0 *3*	(5^-)	
3017.2 *3*		
3029.47 *11*		
3029.61 *7*	$(5^+,6^+)$	
3254.36 *8*	$(4^+,5,6^+)$	
3298.3	8^+	E(level): level from 1977Ko05 only.
3417.62 *10*	$(4^+,5,6^+)$	

† From least-squares fit to Eγ values.

‡ From Adopted Levels.

^{86}Nb ε decay (88 s) 1985Wa10 (continued)

γ(^{86}Zr)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
163.34‡#	<0.3	3417.62	(4+,5,6+)	3254.36	(4+,5,6+)	
224.64‡#	<0.5	3254.36	(4+,5,6+)	3029.61	(5+,6+)	
301.84‡#	<0.7	2343.73	(4+,3−)	2041.89	(0+ to 4+)	
311.25 *3*	1.4 *2*	3017.2		2706.0	(5−)	
359.72 *4*	1.7 *2*	3029.61	(5+,6+)	2669.85	6+	
375.34‡#	<0.6	2041.89	(0+ to 4+)	1666.55	4+	
388.13 *15*	5.5† *5*	3417.62	(4+,5,6+)	3029.47		
584.52 *6*	10.0 *3*	3254.36	(4+,5,6+)	2669.85	6+	
620.11 *9*	7.8 *4*	2041.89	(0+ to 4+)	1421.76	(2+)	
628.8 *5*	6 *2*	3298.3	8+	2669.85	6+	E_γ,I_γ: from 1977Ko05 only.
670.01 *4*	15.2 *7*	1421.76	(2+)	751.74	2+	
677.20 *10*	2.5 *4*	2343.73	(4+,3−)	1666.55	4+	
747.76 *9*	6.6 *6*	3417.62	(4+,5,6+)	2669.85	6+	
751.74 *3*	100.0 *25*	751.74	2+	0.0	0+	
914.81 *5*	79.9 *17*	1666.55	4+	751.74	2+	
921.96 *6*	6.2 *5*	2343.73	(4+,3−)	1421.76	(2+)	
987.57 *9*	5.2 *5*	3029.47		2041.89	(0+ to 4+)	
1003.24 *5*	38.2 *9*	2669.85	6+	1666.55	4+	
1039.4 *3*	6.5† *20*	2706.0	(5−)	1666.55	4+	
1290.3 *3*	2.1 *3*	2041.89	(0+ to 4+)	751.74	2+	
1363.13 *6*	9.3 *6*	3029.61	(5+,6+)	1666.55	4+	
1421.66 *20*	2.3 *3*	1421.76	(2+)	0.0	0+	
1587.75 *10*	9.0 *6*	3254.36	(4+,5,6+)	1666.55	4+	
1591.98‡#	<0.7	2343.73	(4+,3−)	751.74	2+	
1751.14 *20*	4.2 *3*	3417.62	(4+,5,6+)	1666.55	4+	

† Contamination intensity subtracted.
‡ Questionable γ is omitted in Adopted dataset.
# Placement of transition in the level scheme is uncertain.

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Decay Scheme

Intensities: Relative I_γ