^{60}Ni(^{28}Si,2pnγ) 2003Wa36

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 116, 1 (2014)	31-Dec-2013

2003Wa36: E(^{28}Si)=102 MeV. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO), excitation functions (from 95 to 120 MeV beam energy) using an array of ten BGO Compton-suppressed Ge detectors. Complete data details of this work are not available, only Eγ and level scheme are given.

2007Yu03: E=98 MeV, measured g factors by transient-magnetic field ion implantation perturbed angular distribution (TMF-IMPAD) technique. 2007Yu03 is a conference paper and full details of this study are not available. The evaluators have read g factors from authors' figure 3 giving measured g factors versus spin.

Additional information 1.

Other: 1985OnZY: E=85-100 MeV.

^{85}Zr Levels

E(level)[†]	J$^\pi$[‡]	Comments
0	7/2$^+$	
50.12[d] *4*	9/2$^+$	
790.1[&] *9*	9/2$^-$	
854.4 *7*	11/2$^+$	
872.4[d] *7*	13/2$^+$	
1043.0[#] *8*	13/2$^+$	
1176.2[#] *8*	11/2$^+$	
1328.3[#] *10*	11/2$^-$	
1394.2[#] *8*		
1494.4 *10*	13/2$^+$	
1758.9 *8*	15/2$^+$	
1884.6[d] *8*	17/2$^+$	
1941.5 *7*	15/2$^+$	
2078.4 *7*	15/2$^+$	
2556.2 *9*	15/2$^-$	
2625.3[e] *7*	17/2$^-$	g=+1.3 *4* (2007Yu03)
2725.0 *7*	17/2$^-$	
2958.3[e] *9*	19/2$^-$	g=+1.1 *3* (2007Yu03)
3018.7[d] *12*	21/2$^+$	
3073.5 *12*	21/2$^+$	
3387.1[e] *10*	21/2$^-$	g=+0.85 *25* (2007Yu03)
3456.2[#] *12*	(21/2$^-$)	
3516.5 *12*	23/2$^+$	
3522.3[#] *13*	(21/2$^-$)	
3838.0[ae] *11*	23/2$^-$	g=+0.43 *27* (2007Yu03)
3959.2[d] *13*	25/2$^+$	
3992.7 *13*	(23/2$^-$)	
4204.8[#] *14*	25/2$^+$	
4267.8?[#@] *15*	(25/2$^-$)	
4374.2[e] *12*	25/2$^-$	
4589.2 *13*	27/2$^+$	
4887.0 *15*	27/2$^-$	
4983.2[#] *16*	(29/2$^-$)	
4997.2[d] *14*	29/2$^+$	
5023.2[#e] *15*	(27/2$^-$)	
5522.2[#@] *17*	(31/2$^+$)	

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^{60}Ni(^{28}Si,2pnγ) 2003Wa36 (continued)

^{85}Zr Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	E(level)[†]	J$^{\pi}$[‡]	E(level)[†]	J$^{\pi}$[‡]
5530.0[#] *18*	(29/2$^-$)	6240.2[d] *18*	33/2$^+$	10542.2[#bd] *25*	(45/2$^+$)
5653.2[#@] *15*	(29/2$^-$)	7485.2[d] *20*	37/2$^+$	12414.2[#@cd] *27*	(49/2$^+$)
6003.2[#] *18*	33/2$^+$	8920.2[d] *23*	(41/2$^+$)		

[†] From least-squares fit to Eγ data.

[‡] From $\gamma\gamma$(DCO) data and band structures in 2003Wa36.

[#] Level is proposed by 2003Wa36 only. This level and associated γ rays are treated as tentative in the Adopted Levels, Gammas, since details of this work are lacking and further work is needed to confirm the level and gammas from it.

[@] Level is not included in Adopted Levels due to tentative assignment of γ ray from this level in 2003Wa36.

[&] Level proposed only in 2003Wa36, not given in Adopted Levels since there is some uncertainty about the placement of 790γ. This γ is shown to feed the 50-keV level in figure 1 of 2003Wa36, but 750-538-790 cascade from 2078-keV level requires 790γ to be a g.s. transition.

[a] 2007Yu03 state that g factor of 23/2$^-$ state was not corrected for the precession transfer since transitions from weakly populated higher levels were not seen.

[b] 10555 In level-scheme figure 1 of 2003Wa36 is a misprint if Eγ=1622 is correct. This level is not included In Adopted Levels.

[c] 12427 In level-scheme figure 1 of 2003Wa36 is a misprint if Eγ=1872 is correct.

[d] Band(A): Yrast band, $\nu g_{9/2}$ orbital. First band crossing at 21/2$^+$ and $\hbar\omega$=0.49 MeV due to pair of $g_{9/2}$ protons, second band crossing at 33/2$^+$ and $\hbar\omega$=0.63 MeV due to pair of $g_{9/2}$ neutrons. Thus 21/2$^+$ state would have a 3-quasiparticle $\nu g_{9/2}\otimes\pi g^2_{9/2}$ configuration, and 33/2$^+$ state, a 5-quasiparticle $\nu g^3_{9/2}\otimes\pi g^2_{9/2}$ configuration.

[e] Band(B): Possible Magnetic dipole rotational band. Proposed configuration=$\pi g^2_{9/2\ 8}\otimes\nu f_{7/2}$ (2007Yu03) from their g factor measurements and interpretation as magnetic-rotational structure. In 2002Ta11 and 1995Ju04, however, this band is interpreted as strongly-coupled structure.

γ(^{85}Zr)

Eγ	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$	Eγ	E$_i$(level)	J$^{\pi}_i$	E$_f$	J$^{\pi}_f$
50.12[a] *4*	50.12	9/2$^+$	0	7/2$^+$	536	4374.2	25/2$^-$	3838.0	23/2$^-$
100	2725.0	17/2$^-$	2625.3	17/2$^-$	538	1328.3	11/2$^-$	790.1	9/2$^-$
126	1884.6	17/2$^+$	1758.9	15/2$^+$	547[#]	2625.3	17/2$^-$	2078.4	15/2$^+$
169	2725.0	17/2$^-$	2556.2	15/2$^-$	606	3992.7	(23/2$^-$)	3387.1	21/2$^-$
233[@]	2958.3	19/2$^-$	2725.0	17/2$^-$	630[@]	4589.2	27/2$^+$	3959.2	25/2$^+$
333[#]	2958.3	19/2$^-$	2625.3	17/2$^-$	640[@]	1494.4	13/2$^+$	854.4	11/2$^+$
382[‡]	3838.0	23/2$^-$	3456.2	(21/2$^-$)	643	5530.0	(29/2$^-$)	4887.0	27/2$^-$
382[‡]	4374.2	25/2$^-$	3992.7	(23/2$^-$)	646[@]	2725.0	17/2$^-$	2078.4	15/2$^+$
384[‡]	4589.2	27/2$^+$	4204.8	25/2$^+$	649	5023.2	(27/2$^-$)	4374.2	25/2$^-$
408[@]	4997.2	29/2$^+$	4589.2	27/2$^+$	684[‡]	2078.4	15/2$^+$	1394.2	
429[#]	3387.1	21/2$^-$	2958.3	19/2$^-$	684[#]	2625.3	17/2$^-$	1941.5	15/2$^+$
437[‡]	3959.2	25/2$^+$	3522.3	(21/2$^-$)	688	4204.8	25/2$^+$	3516.5	23/2$^+$
443[@]	3516.5	23/2$^+$	3073.5	21/2$^+$	716[‡]	1758.9	15/2$^+$	1043.0	13/2$^+$
443[@]	3959.2	25/2$^+$	3516.5	23/2$^+$	741[@]	2625.3	17/2$^-$	1884.6	17/2$^+$
447[@]	1941.5	15/2$^+$	1494.4	13/2$^+$	750[‡]	2078.4	15/2$^+$	1328.3	11/2$^-$
449	3522.3	(21/2$^-$)	3073.5	21/2$^+$	766[‡]	1941.5	15/2$^+$	1176.2	11/2$^+$
451[@]	3838.0	23/2$^-$	3387.1	21/2$^-$	784	2725.0	17/2$^-$	1941.5	15/2$^+$
498	3456.2	(21/2$^-$)	2958.3	19/2$^-$	790[†@]	790.1	9/2$^-$	0	7/2$^+$
498[@]	3516.5	23/2$^+$	3018.7	21/2$^+$	804[#]	854.4	11/2$^+$	50.12	9/2$^+$

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^{60}Ni(^{28}Si,2pnγ) 2003Wa36 (continued)

γ(^{85}Zr) (continued)

E_γ	E_i(level)	J_i^π	E_f	J_f^π
822[#]	872.4	13/2+	50.12	9/2+
831[‡]	3387.1	21/2−	2556.2	15/2−
840	2725.0	17/2−	1884.6	17/2+
866[@]	2625.3	17/2−	1758.9	15/2+
879	3838.0	23/2−	2958.3	19/2−
886[@]	1758.9	15/2+	872.4	13/2+
933[&b]	5522.2	(31/2+)	4589.2	27/2+
940[‡@]	3959.2	25/2+	3018.7	21/2+
966[‡]	2725.0	17/2−	1758.9	15/2+
987	4374.2	25/2−	3387.1	21/2−
993	1043.0	13/2+	50.12	9/2+
1006	6003.2	33/2+	4997.2	29/2+
1012[#]	1884.6	17/2+	872.4	13/2+
1024	4983.2	(29/2−)	3959.2	25/2+
1038[@]	4997.2	29/2+	3959.2	25/2+
1049	4887.0	27/2−	3838.0	23/2−
1069[@]	1941.5	15/2+	872.4	13/2+
1073[@]	4589.2	27/2+	3516.5	23/2+
1074[‡]	2958.3	19/2−	1884.6	17/2+
1087[@]	1941.5	15/2+	854.4	11/2+
1134[#]	3018.7	21/2+	1884.6	17/2+
1177	1176.2	11/2+	0	7/2+
1189[#]	3073.5	21/2+	1884.6	17/2+
1206	2078.4	15/2+	872.4	13/2+
1224	2078.4	15/2+	854.4	11/2+
1243[@]	6240.2	33/2+	4997.2	29/2+
1245	7485.2	37/2+	6240.2	33/2+
1249[&b]	4267.8?	(25/2−)	3018.7	21/2+
1279[&b]	5653.2	(29/2−)	4374.2	25/2−
1329[†&b]	1328.3	11/2−	0	7/2+
1394[†]	1394.2		0	7/2+
1435	8920.2	(41/2+)	7485.2	37/2+
1622[&]	10542.2	(45/2+)	8920.2	(41/2+)
1684	2556.2	15/2−	872.4	13/2+
1872[&b]	12414.2	(49/2+)	10542.2	(45/2+)

[†] Placements of 684 and 750 γ rays from 2078 level can be correct only if 790γ, 1329γ and 1394γ feed the g.s., not the 50-keV level as shown in figure 1 of 2003Wa36.

[‡] The γ is from 2003Wa36 only, it is treated as tentative in the Adopted Gammas. From the thickness of the arrows shown in the level scheme figure 1 of 2003Wa36, it seems a weak γ ray.

[#] Strong γ ray.

[@] Medium-intensity γ ray.

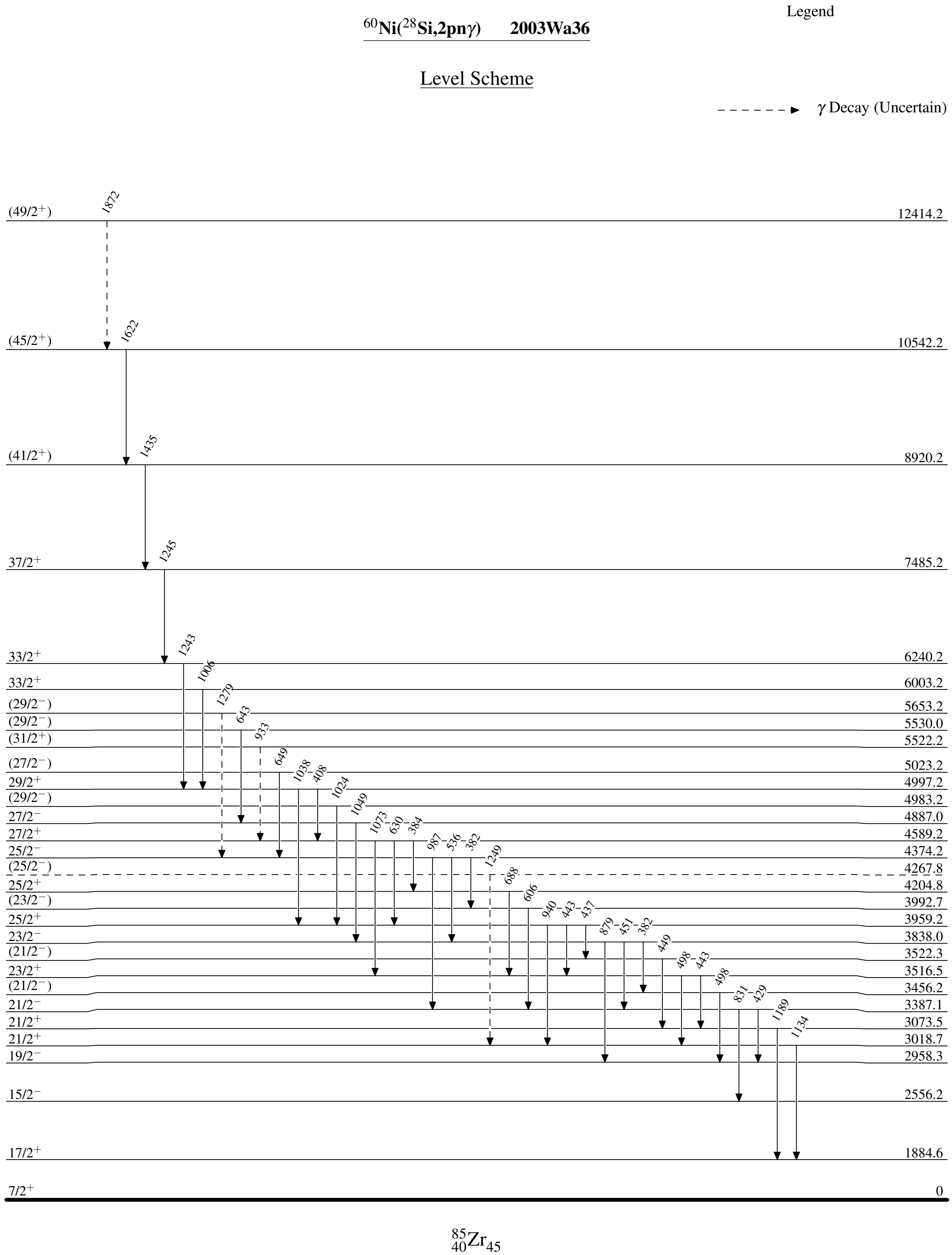
[&] This γ is not included in Adopted Gammas due to its tentative assignment in 2003Wa36.

[a] From Adopted Gammas for ^{85}Zr.

[b] Placement of transition in the level scheme is uncertain.

^{60}Ni(^{28}Si,2pnγ) 2003Wa36

Level Scheme

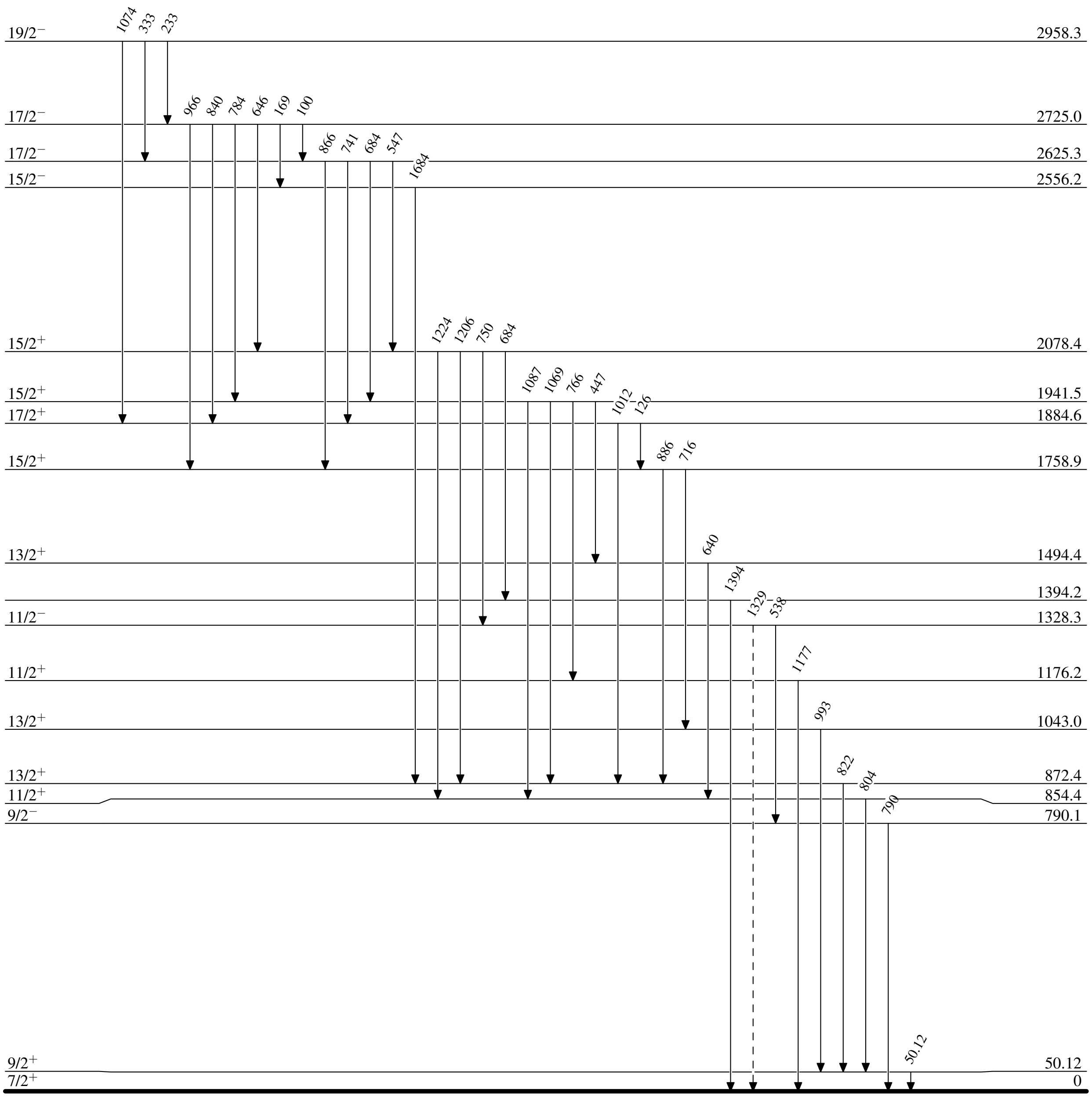


$^{60}Ni(^{28}Si,2pn\gamma)$ 2003Wa36

Level Scheme (continued)

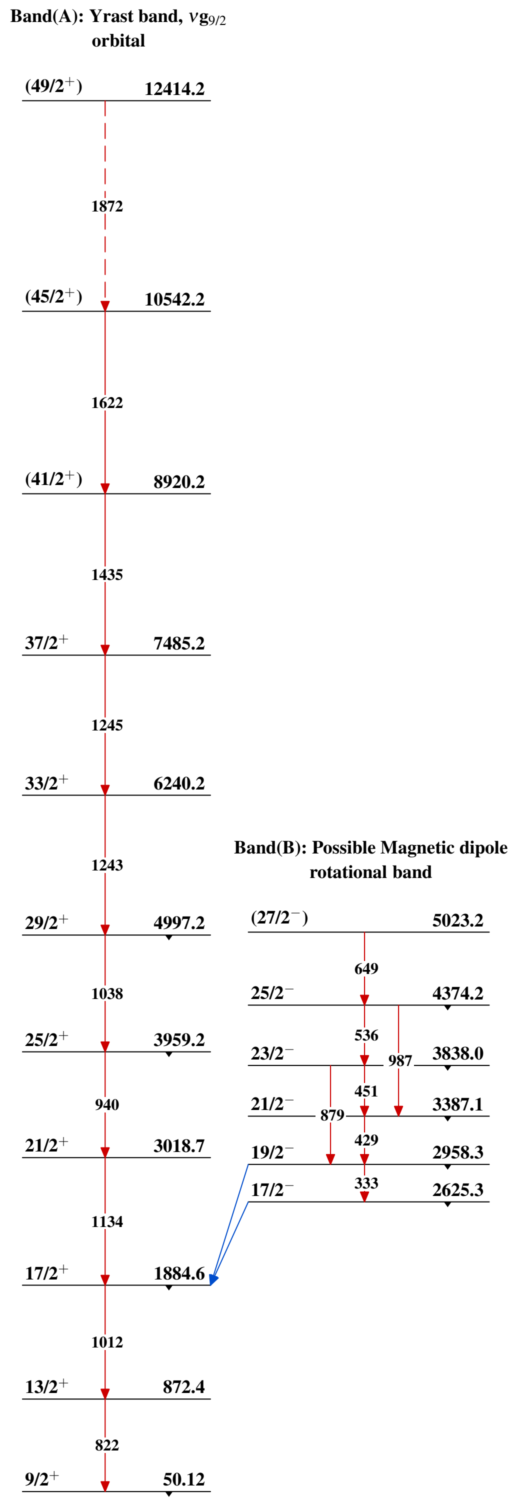
Legend

γ Decay (Uncertain)



$^{85}_{40}Zr_{45}$

$^{60}Ni(^{28}Si,2pn\gamma)$ 2003Wa36



$^{85}_{40}Zr_{45}$