^{9}Be(^{36}S,2npγ),(^{37}P,4nγ)   **1998Mo16,2005IdZZ**

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

1998Mo16: E(^{36}S)=90, 100, 110 MeV ^{36}S beam was produced from the TANDEM accelerator of the University and Technical University Munich. Target of beryllium evaporated onto gold backing. γ-rays were detected with Compton-suppressed HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, pγ-coin, recoil-γ coin. Deduced levels, branching ratios.

2005IdZZ: E(^{37}P)≈6 MeV/nucleon secondary beam from ^{9}Be(^{40}Ar,X),E=63 MeV/nucleon primary reaction using RIPS separator at RIKEN facility. Measured Eγ using GRAPE array of 14 segmented Ge detectors. Gamma rays of 151, 440 and 570 keV were seen. Deduced 107, 258 and 699 keV levels in ^{42}K from 106-151-440 cascade. It is not clear to the evaluators whether the 570γ is the same as the 571.9 transition from the 1947 level since no 676.8γ in cascade with 571.9γ is not seen by 2005IdZZ.

Additional information 1.

All data are from ^{9}Be(^{36}S,2npγ) (1998Mo16), unless otherwise stated.

^{42}K Levels

E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]	E(level)[†]	J$^\pi$[‡]
0	2$^-$	841.82 10	3$^-$	1936.06 14		2991.51 13	(5$^+$ to 9$^+$)
106.80 4	3$^-$	1143.46 5	4$^+$	1947.68 8	7$^+$	3168.1 4	(2$^+$ to 6$^+$)
258.26 5	4$^-$	1254.7 3	2$^-$	2113.8 3		3497.81 23	(2$^+$ to 9$^-$)
638.63 4	3$^-$	1273.29 13	(2$^-$,3,4$^+$)	2358.97 10	(4$^+$ to 7$^-$)	3559.90 14	(5$^+$ to 9$^+$)
682.10 11	(2,3)	1375.81 7	6$^+$	2524.7 4	(2,3,4)	4092.14 22	(3$^+$ to 9$^-$)
699.03 5	5$^-$	1538.62 9	3$^+$	2765.9 6	(2$^+$,3)	4745.9 3	(3$^+$ to 10)

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

[‡] From Adopted Levels.

γ(^{42}K)

Eγ	Iγ[@]	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$
106.83[#] 5	100.0 17	106.80	3$^-$	0	2$^-$
151.48[‡] 4	103.5 20	258.26	4$^-$	106.80	3$^-$
232.4 4	5.95 24	1375.81	6$^+$	1143.46	4$^+$
380.39 5	3.93 15	638.63	3$^-$	258.26	4$^-$
395.16 7	3.55 19	1538.62	3$^+$	1143.46	4$^+$
422.8 3	2.3 3	2358.97	(4$^+$ to 7$^-$)	1936.06	
431.44 9	1.73 26	1273.29	(2$^-$,3,4$^+$)	841.82	3$^-$
440.78[‡] 4	77.4 11	699.03	5$^-$	258.26	4$^-$
444.43 5	5.12 26	1143.46	4$^+$	699.03	5$^-$
504.83 4	12.41 28	1143.46	4$^+$	638.63	3$^-$
531.80 6	8.8 5	638.63	3$^-$	106.80	3$^-$
^{x}542.42 23	5.59 25				
571.86[‡] 4	7.7 23	1947.68	7$^+$	1375.81	6$^+$
592.23 6	3.58 21	699.03	5$^-$	106.80	3$^-$
616.09 29	2.4 3	1254.7	2$^-$	638.63	3$^-$
632.68 20	1.79 20	2991.51	(5$^+$ to 9$^+$)	2358.97	(4$^+$ to 7$^-$)
638.60 5	5.7 3	638.63	3$^-$	0	2$^-$
676.77 4	47.8 7	1375.81	6$^+$	699.03	5$^-$
682.09 11	1.72 16	682.10	(2,3)	0	2$^-$
^{x}735.7[†] 3	0.79[&] 14				
841.78 10	4.7 4	841.82	3$^-$	0	2$^-$
983.16 9	4.7 5	2358.97	(4$^+$ to 7$^-$)	1375.81	6$^+$

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^{9}Be(^{36}S,2npγ),(^{37}P,4nγ)   **1998Mo16,2005IdZZ (continued)**

γ(^{42}K) (continued)

E$_\gamma$	I$_\gamma$[@]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
986.1 *4*	0.94[&] *25*	2524.7	(2,3,4)	1538.62	3$^+$
1015.5 *4*	0.91[&] *25*	1273.29	(2$^-$,3,4$^+$)	258.26	4$^-$
1043.79 *14*	2.74 *25*	2991.51	(5$^+$ to 9$^+$)	1947.68	7$^+$
1054.3 *3*	0.67[&] *15*	3168.1	(2$^+$ to 6$^+$)	2113.8	
1100.67 *18*	2.06[&] *20*	4092.14	(3$^+$ to 9$^-$)	2991.51	(5$^+$ to 9$^+$)
1138.78 *24*	1.24[&] *17*	3497.81	(2$^+$ to 9$^-$)	2358.97	(4$^+$ to 7$^-$)
1237.07 *16*	2.80[&] *24*	1936.06		699.03	5$^-$
1248.00 *27*	1.13[&] *16*	4745.9	(3$^+$ to 10)	3497.81	(2$^+$ to 9$^-$)
[x]1291.4 *6*	0.45[&] *13*				
[x]1296.6 *6*	0.51[&] *13*				
[x]1511.2 *5*	0.65[&] *16*				
1612.19 *11*	2.55 *26*	3559.90	(5$^+$ to 9$^+$)	1947.68	7$^+$
1659.91 *16*	1.78 *24*	2358.97	(4$^+$ to 7$^-$)	699.03	5$^-$
1677.52 *26*	2.3[&] *5*	1936.06		258.26	4$^-$
1682.9 *5*	0.55[&] *14*	2524.7	(2,3,4)	841.82	3$^-$
1732.6 *6*	0.74[&] *22*	4092.14	(3$^+$ to 9$^-$)	2358.97	(4$^+$ to 7$^-$)
1754.4 *3*	1.00[&] *17*	4745.9	(3$^+$ to 10)	2991.51	(5$^+$ to 9$^+$)
[x]1919.9 *4*	0.73[&] *20*				
2024.5 *6*	0.41[&] *11*	3168.1	(2$^+$ to 6$^+$)	1143.46	4$^+$
2083.7 *5*	0.71[&] *14*	2765.9	(2$^+$,3)	682.10	(2,3)
2113.8 *3*	2.1[&] *3*	2113.8		0	2$^-$

[†] Placement from 842 level as proposed by 1985Kr06 in (n,γ) is discarded since this γ is not observed in coincidence with 107γ.
[‡] This γ seen in ^{9}Be(^{37}P,4nγ) (2005IdZZ).
[#] The 106.8γ was not seen in 2005IdZZ.
[@] For E(^{36}S)=90 MeV, unless otherwise stated.
[&] From recoil-gated spectrum at E(^{36}S)=100 MeV.
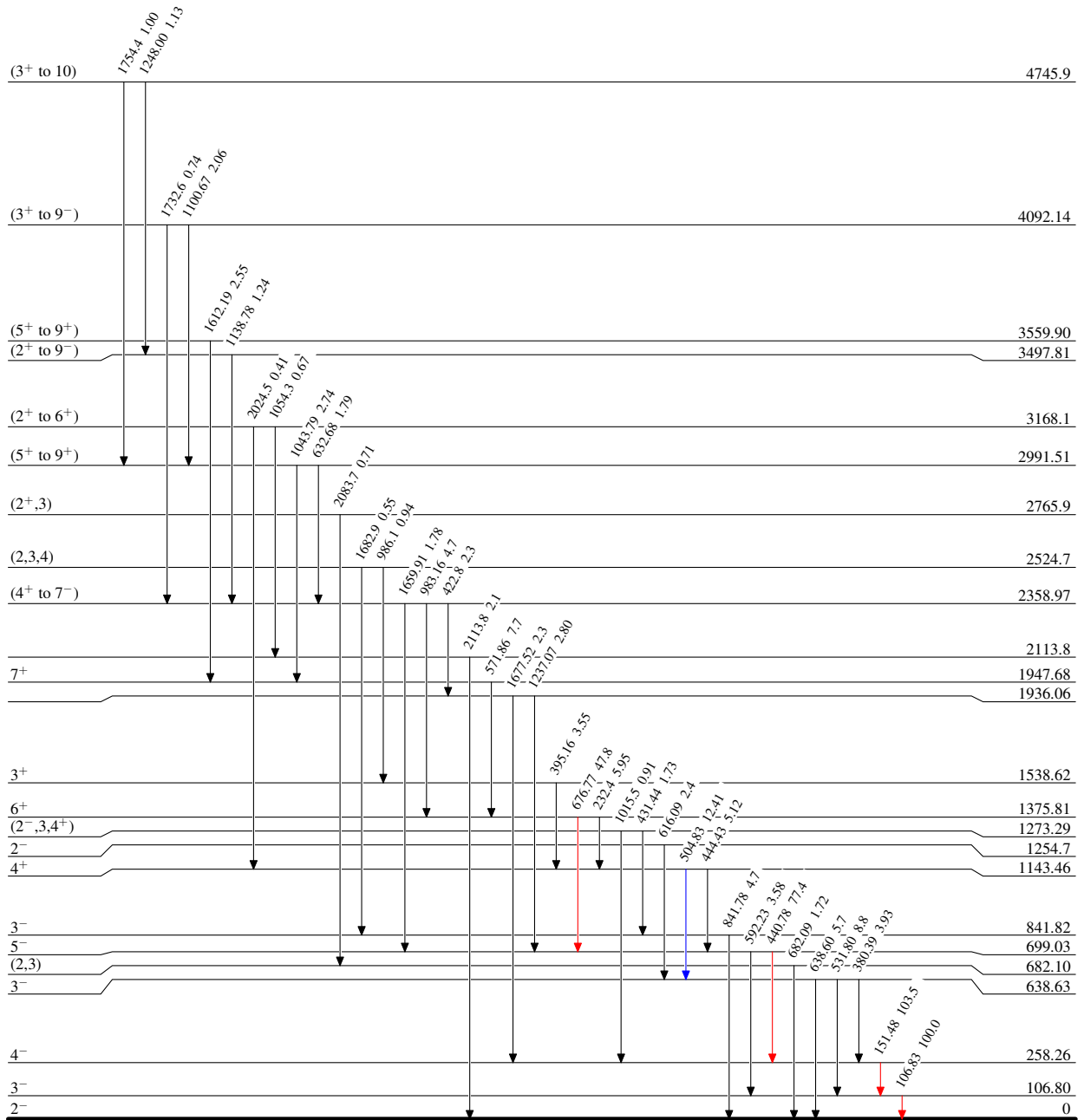[x] γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I$_\gamma$

Legend

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

$^{42}_{19}$K$_{23}$