^{58}Ni(^{54}Fe,2pnγ) 2012Pr10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. Kumar(a), J. Chen(b) and F. G. Kondev	NDS 137, 1 (2016)	31-May-2016

2012Pr10: E(^{54}Fe)=206 MeV from K130 accelerator facility at Jyvaskyla University. Target=1 mg/cm^2 self-supporting ^{58}Ni foil. Detectors: RITU gas-filled separator and GREAT spectrometer at the focal plane, where the recoiling nuclei implanted into a pair of DDSD detectors, PRE-JUROGAM II array (12 four-way segmented Clover Ge detectors). Measured: Eγ, Iγ, γγ-coin, level lifetimes using the Recoil Distance Doppler-shift method (RDDS) using a plunger device in conjunction with the Recoil-decay tagging method.

^{109}Te Levels

E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	E(level)[†]	Jπ[#]	$T_{1/2}$[‡]	E(level)[†]	Jπ[#]
0.0[@]	5/2+		1352.4[a] 5	13/2+		4464.4[&] 12	(27/2+)
97.86[&] 24	7/2+		1532.9[&] 7	15/2+		4673.4[c] 7	29/2+
265.2[a] 5	5/2+		1583.8[b] 4	15/2−	9.7 ps 10	4711.1[b] 7	31/2−
538.1[@] 4	7/2+		2192.8[b] 5	19/2−	3.8 ps 9	5550.7[c] 8	33/2+
690.3[a] 3	9/2+	24 ps 5	2386.7[&] 8	19/2+		5726.8[b] 8	35/2−
763.27[@] 24	9/2+	3.1 ps 20	2887.9[b] 6	23/2−		6399.2[c] 9	37/2+
772.6[&] 3	11/2+		3429.1[&] 10	23/2+		6756.3[b] 10	39/2−
1089.4[b] 3	11/2−	67.0 ps 21	3777.5[b] 7	27/2−			

† From a least-squares fit to Eγ.
‡ From the RDDS method (2012Pr10).
\# From 2012Pr10, based on multipolarities as given in ^{58}Ni(^{58}Ni,α2pnγ) (2000Bo29).
@ Band(A): Band based on the J^π=5/2$^+$ ground state.
& Band(B): Band based on the J^π=7/2$^+$ state at 98 keV.
a Band(C): Band based on the J^π=5/2$^+$ state 265 keV.
b Band(D): Band based on the J^π=11/2$^-$ state at 1089 keV.
c Band(E): Band based on the J^π=29/2$^+$ state at 4673 keV.

γ(^{109}Te)

Eγ[†]	Iγ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]
74 1	<1	763.27	9/2+	690.3	9/2+	
98.2 3	12.9 13	97.86	7/2+	0.0	5/2+	M1+E2
152.4 6	<1	690.3	9/2+	538.1	7/2+	
225.0 6	7.1 14	763.27	9/2+	538.1	7/2+	M1+E2
232 1	<1	1583.8	15/2−	1352.4	13/2+	
265.0 6	10 2	265.2	5/2+	0.0	5/2+	M1+E2
317.0 3	12.9 13	1089.4	11/2−	772.6	11/2+	E1
326.0 3	55 6	1089.4	11/2−	763.27	9/2+	E1
399.0 3	58 6	1089.4	11/2−	690.3	9/2+	E1
424.8 6	8.1 16	690.3	9/2+	265.2	5/2+	E2
494.4 3	100	1583.8	15/2−	1089.4	11/2−	E2
538.0 6	2 1	538.1	7/2+	0.0	5/2+	M1+E2
580.0 6	<1	1352.4	13/2+	772.6	11/2+	
592.4 3	32 3	690.3	9/2+	97.86	7/2+	M1+E2
609.0 3	94 9	2192.8	19/2−	1583.8	15/2−	E2
662.0 6	<1	1352.4	13/2+	690.3	9/2+	
665.8 6	<1	763.27	9/2+	97.86	7/2+	

Continued on next page (footnotes at end of table)

^{58}Ni(^{54}Fe,2pnγ) 2012Pr10 (continued)

γ(^{109}Te) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡
672.2 *6*	7.8 *16*	6399.2	37/2$^+$	5726.8	35/2$^-$	E1
675.0 *3*	23 *2*	772.6	11/2$^+$	97.86	7/2$^+$	E2
695.0 *3*	87 *9*	2887.9	23/2$^-$	2192.8	19/2$^-$	E2
760.3 *6*	8 *2*	1532.9	15/2$^+$	772.6	11/2$^+$	E2
763.0 *3*	45 *5*	763.27	9/2$^+$	0.0	5/2$^+$	E2
839.9 *6*	2.7 *6*	5550.7	33/2$^+$	4711.1	31/2$^-$	E1
848.5 *6*	9.4 *19*	6399.2	37/2$^+$	5550.7	33/2$^+$	E2
853.8 *3*	17.8 *18*	2386.7	19/2$^+$	1532.9	15/2$^+$	E2
877.3 *3*	10.5 *11*	5550.7	33/2$^+$	4673.4	29/2$^+$	E2
889.6 *3*	65 *7*	3777.5	27/2$^-$	2887.9	23/2$^-$	E2
895.9 *3*	11.3 *11*	4673.4	29/2$^+$	3777.5	27/2$^-$	E1
933.7 *3*	38 *4*	4711.1	31/2$^-$	3777.5	27/2$^-$	E2
1015.7 *3*	15.2 *15*	5726.8	35/2$^-$	4711.1	31/2$^-$	E2
1029.4 *6*	1.7 *3*	6756.3	39/2$^-$	5726.8	35/2$^-$	E2
1035.3 *6*	3 *1*	4464.4	(27/2$^+$)	3429.1	23/2$^+$	
1042.4 *6*	3.7 *7*	3429.1	23/2$^+$	2386.7	19/2$^+$	E2

† From 2012Pr10.
‡ Taken by 2012Pr10 from the $\gamma(\theta)$ data in ^{58}Ni(^{58}Ni,α2pnγ) (2000Bo29).

^{58}Ni(^{54}Fe,2pnγ) 2012Pr10

Level Scheme

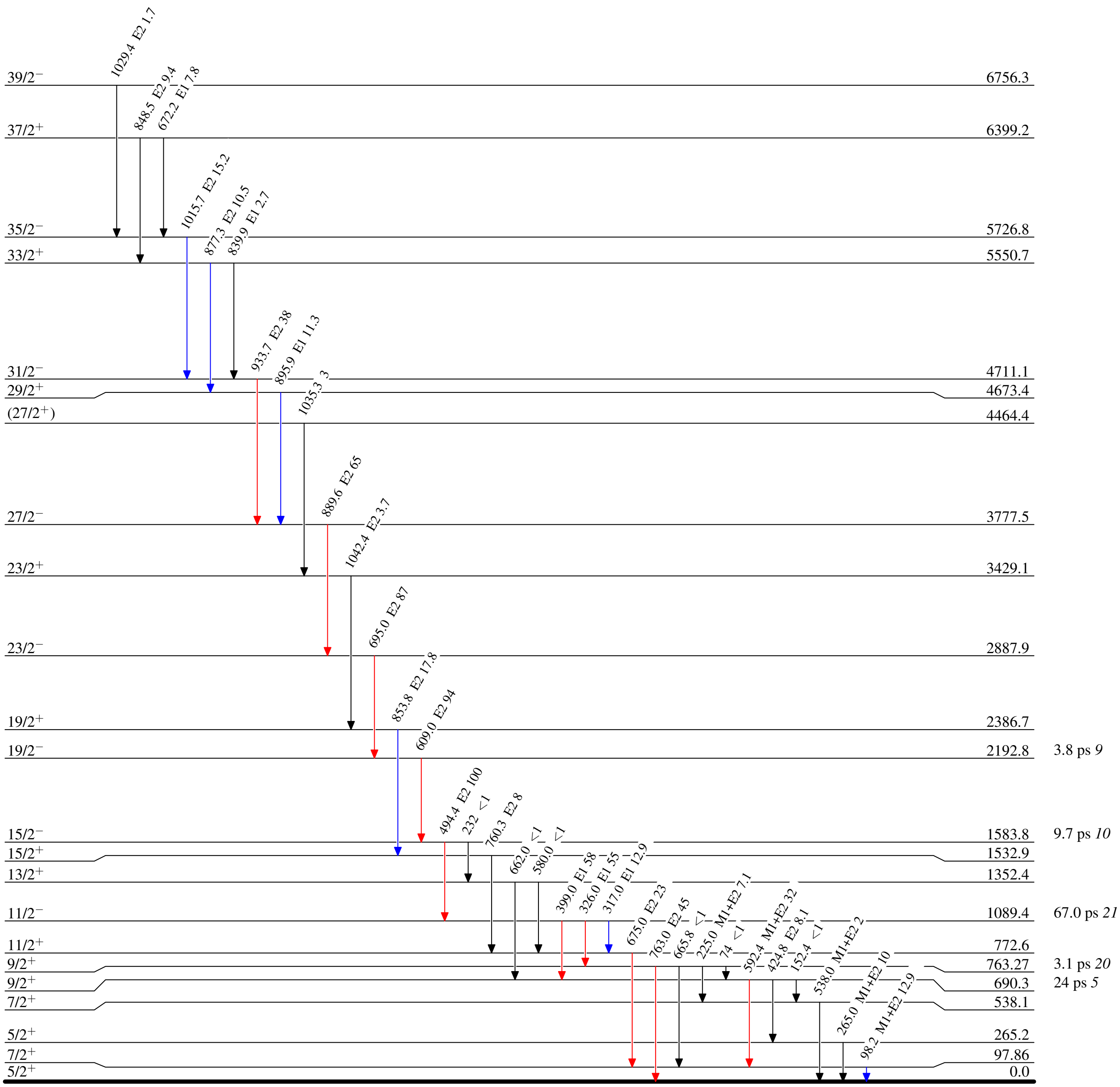
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

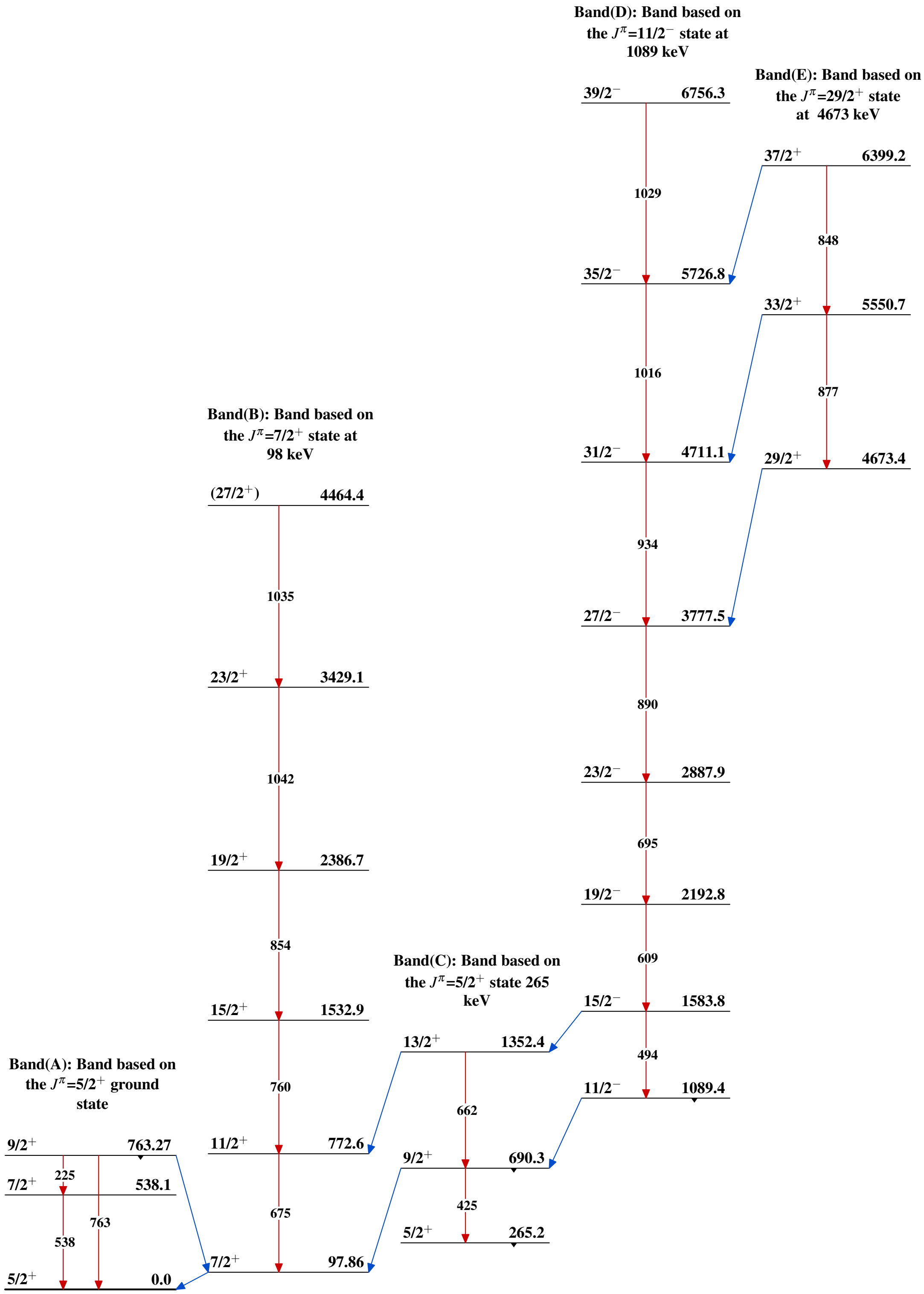
$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{109}_{52}Te_{57}$

$^{58}Ni(^{54}Fe,2pn\gamma)$ 2012Pr10



$^{109}_{52}Te_{57}$