

$^{58}\text{Fe}(\text{p},\text{p}')$ 1971Li14

Type	Author	History	Citation	Literature Cutoff Date
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Others: 1975Br29 ($^{58}\text{Fe}(\text{p},\text{p}'\gamma)$), 1972Pe23.

1971Li14: $E(\text{p})=2.0\text{-}3.1$ MeV, but data not analyzed beyond 2.65 MeV; measured $\sigma(E(\text{p}),\theta)$, $\theta=90^\circ, 120^\circ, 135^\circ$, and 160° , beam resolution 300-400 eV.

See 1972Pe23 for correlations between fine structure widths of 14 $^{59}\text{Fe}(\text{g.s.})$ analogue fragments in (p,p), (p,p') and (p, γ), $E(\text{p})\approx 2210\text{-}2300$.

 ^{59}Co Levels

Data are from 1971Li14. The fragmented analogues of $^{59}\text{Fe}(\text{g.s.})$ ($J^\pi=3/2^-$, 14 fragments) and $^{59}\text{Fe}(287)$ ($J^\pi=1/2^-$, 10 fragments) have their centroids at $E(\text{p})(\text{lab})=2220.5$ and 2512.5 , respectively. A third analogue near $E(\text{p})=2.98$ MeV was identified but not analyzed. Since $E(\text{p})$ is well below the Coulomb barrier, only s-, p- and d-wave resonances are expected.

$E(\text{level})^\dagger$	J^π^\ddagger	$E(\text{p})(\text{lab})^\oplus$	$\Gamma_{\text{p}0}$ eV $^\#$
9465.3 & 30	(3/2 ⁻)	2137.8	10 5
9491.3 30	1/2 ⁺	2164.3	30 10
9513.7 & 30	(3/2 ⁻)	2187.1	30 10
9523.1 30	1/2 ⁺	2196.6	15 8
9525.4 30	1/2 ⁺	2199.0	15 8
9534.9 & 30	(3/2 ⁻)	2208.6	30 10
9538.3 & 30	(3/2 ⁻)	2212.1	25 10
9538.8 30	1/2 ⁺	2212.6	25 10
9541.5 & 30	(3/2 ⁻)	2215.3	10 5
9543.9 & 30	(3/2 ⁻)	2217.8	15 8
9545.0 & 30	3/2 ⁻	2218.9	95 20
9548.8 & 30	3/2 ⁻	2222.8	80 20
9550.4 & 30	(3/2 ⁻)	2224.4	10 5
9554.4 & 30	(3/2 ⁻)	2228.5	15 8
9556.4 & 30	(3/2 ⁻)	2230.5	10 5
9592.5 & 30	(3/2 ⁻)	2267.2	20 10
9594.0 & 30	(3/2 ⁻)	2268.8	10 5
9601.5 30	1/2 ⁺	2276.4	25 10
9617.9 & 30	(3/2 ⁻)	2293.1	10 5
9620.4 30	1/2 ⁺	2295.6	15 8
9640.2 30	1/2 ⁺	2315.8	25 10
9681.6 30	1/2 ⁺	2357.9	40 10
9695.1 30	1/2 ⁺	2371.6	20 10
9715.6 30	1/2 ⁺	2392.5	35 10
9744.2 30	1/2 ⁺	2421.5	80 20
9748.3 30	1/2 ⁺	2425.7	35 10
9751.6 30	1/2 ⁺	2429.1	40 10
9751.8 ^a 30	(1/2 ⁻)	2429.3	10 5
9764.0 30	1/2 ⁺	2441.7	50 15
9782.2 30	1/2 ⁺	2460.2	25 10
9792.0 30	1/2 ⁺	2470.2	30 10
9801.6 ^a 30	(1/2 ⁻)	2479.9	25 10
9805.3 ^a 30	(1/2 ⁻)	2483.7	20 10
9806.6 ^a 30	(1/2 ⁻)	2485.0	15 8

Continued on next page (footnotes at end of table)

$^{58}\text{Fe}(p,p')$ 1971Li14 (continued) ^{59}Co Levels (continued)

E(level) [†]	J ^π [‡]	E(p)(lab) [@]	Γ _{p0} eV [#]	Comments
9811.6 30	1/2 ⁺	2490.1	30 10	
9818.9 30	1/2 ⁺	2497.5	20 10	
9825.4 30	1/2 ⁺	2504.1	25 10	
9829.5 ^a 30	(1/2 ⁻)	2508.3	15 8	
9837.2 30	1/2 ⁺	2516.1	50 10	
9837.4 ^a 30	1/2 ⁻	2516.4	50 20	
9842.2 ^a 30	(1/2 ⁻)	2521.2	25 10	
9843.3 30	1/2 ⁺	2522.4	35 10	
9846.3 ^a 30	(1/2 ⁻)	2525.4	15 8	
9855.0 ^a 30	(1/2 ⁻)	2534.3	25 10	
9856.6 30	1/2 ⁺	2535.9	35 10	
9861.0 30	(3/2 ⁻)	2540.4	15 8	
9864.1 30	1/2 ⁺	2543.5	25 10	
9890.8 ^a 30	(1/2 ⁻)	2570.7	25 10	
9908.6 30	1/2 ⁺	2588.8	40 10	
9911.1 30	1/2 ⁺	2591.3	25 10	
9917.6 30	1/2 ⁺	2597.9	30 10	
9938.6 30	1/2 ⁺	2619.3	20 10	
9947.7 30	(3/2 ⁺)	2628.6	15 8	
9949.7 30	1/2 ⁺	2630.5	10 5	
9950.6 30	1/2 ⁺	2631.5	20 10	
9956.6 30	1/2 ⁺	2637.6	70 20	
9959.3 30	(1/2 ⁻)	2640.4	10 5	
9963.5 30	1/2 ⁺	2644.6	40 10	
9966.8 30	(3/2 ⁻)	2648.0	10 5	
9969.9 30	1/2 ⁺	2651.1	45 10	
≈10293	(3/2 ⁻)	2980≈		J ^π : analogue of 3/2 ⁻ ^{59}Fe (726 level); identified but not analyzed in detail by 1971Li14.

[†] Calculated as E(p)(c.m.)+S(p), where S(p)=7363.6 4 (2017Wa10).

[‡] From multilevel, multichannel R-matrix analysis of $\sigma(E(p),\theta)$.

[#] Γ_{p0} in eV (1971Li14). Γ_{p'}(811) was neglected in analysis by 1971Li14 and, typically, Γ_γ<<Γ_{p0} (see (p,γ)), so Γ_{p0}≈Γ. See 1972Pe23 for additional Γ_{p0} and Γ_{p1} data.

[@] Laboratory proton energy of resonance (1971Li14); ΔE≈3 keV (absolute), 0.2 keV (relative). E(p) from 1972Pe23, 1975Br29≈5 keV higher.

[&] Possible ^{59}Fe (g.s.) analogue fragment (1971Li14). Analogue energy estimated to be 9545 5 (1971Li14).

^a Possible ^{59}Fe (287 level) analogue fragment (1971Li14). Analogue energy estimated to be 9835 5 (1971Li14).