^{87}Sr(p,nγ) 1980Ta13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson and W. D. Kulp(a)	NDS 129, 1 (2015)	27-Jul-2015

E_p= from 2.9 to 5.3 MeV in 50-keV steps; measured γ-ray excitation functions, angular distributions, and conversion electrons.

^{87}Y Levels

E(level)†	Jπ‡	Comments
0.0	1/2⁻	
380.9 *1*	9/2⁺	
793.9 *1*	5/2⁻	
982.9 *1*	3/2⁻	
1153.0 *2*	5/2⁺	
1182.1 *1*	3/2⁻	Jπ: assignment in Adopted Levels is (3/2)⁻.
1203.2 *1*	5/2⁻	Jπ: assignment in Adopted Levels is (5/2)⁻.
1405.2 *2*	(11/2⁺,13/2⁺)	Jπ: assignment in Adopted Levels is (13/2⁺).
1591.5 *2*	(11/2⁺)	Jπ: assignment in Adopted Levels is 11/2⁺.
1608.7 *2*	(9/2⁺)	Jπ: assignment in Adopted Levels is (7/2⁺,9/2⁺).
1630.1 *2*	7/2⁻	Jπ: assignment in Adopted Levels is (1/2⁻,3/2⁻).
1704.7 *4*	3/2⁺	Jπ: assignment in Adopted Levels is (5/2⁻).
1756.2 *2*	5/2⁻	Jπ: assignment in Adopted Levels is (5/2⁻,7/2⁻).
1801.7 *2*	5/2⁻	Jπ: assignment in Adopted Levels is (1/2⁻,3/2,5/2⁻).
1980.1 *2*	7/2⁻	Jπ: assignment in Adopted Levels is (7/2,9/2)⁻.
2009.2 *2*	(9/2⁻,11/2⁻)	Jπ: assignment in Adopted Levels is (7/2).
2038.6 *2*	(11/2,13/2)	Jπ: assignment in Adopted Levels is (15/2⁺).
2073.4 *2*	(7/2⁺,9/2⁺)	
2112.7 *5*	5/2⁺	
2154.8 *2*	(9/2,11/2)⁻	Jπ: assignment in Adopted Levels is (9/2⁻).
2186.2 *3*	(5/2,7/2,9/2)	Jπ: assignment in Adopted Levels is 7/2⁻.
2202.6 *2*	≥7/2	Jπ: assignment in Adopted Levels is 7/2⁺,9/2⁺.
2277.7 *2*	(7/2,9/2)	Jπ: assignment in Adopted Levels is (7/2⁻).
2302.2 *2*	≥7/2	Jπ: assignment in Adopted Levels is 13/2⁺.
2345.1 *2*	≥9/2	
2353.6 *2*	(7/2,9/2,11/2)	
2367.9 *3*	≥9/2	Jπ: assignment in Adopted Levels is 15/2⁻.
2400.4 *4*	≥9/2	

† From least-squares fit to γ-ray energies.

‡ Assignments are from this work based on γ excitation functions dnd angular distributions, except those for levels below 1170 keV which are from ^{87}Y Adopted Levels. Differences from Adopted Levels are noted.

γ(^{87}Y)

E_γ	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.@	Comments
380.9 *1*		380.9	9/2⁺	0.0	1/2⁻		
409.2 *1*	4.38 *15*	1203.2	5/2⁻	793.9	5/2⁻		
523.3 *7*	1.28 *22*	1704.7	3/2⁺	1182.1	3/2⁻		
552.6 *2*	2.31 *22*	1756.2	5/2⁻	1203.2	5/2⁻		
574.1 *1*	5.54 *23*	1756.2	5/2⁻	1182.1	3/2⁻		
611.2 *2*	3.0 *3*	2202.6	≥7/2	1591.5	(11/2⁺)		
619.8 *2*	1.21 *22*	1801.7	5/2⁻	1182.1	3/2⁻		
633.6 *1*	11.17 *18*	2038.6	(11/2,13/2)	1405.2	(11/2⁺,13/2⁺)	(M1,E2)	α(K)exp: =1.77×10⁻³ *45*. Mult.: D,Q, but since Jπ from the Adopted

Continued on next page (footnotes at end of table)

^{87}Sr(p,nγ) 1980Ta13 (continued)

γ(^{87}Y) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	Comments
							Levels is $(15/2^+)$ and this γ decays to a $(13/2^+)$, E1 can be ruled out leaving M1,E2.
711.4 *3*	[‡]	2302.2	≥7/2	1591.5	$(11/2^+)$		
771.9 *1*	31.8 *4*	1153.0	$5/2^+$	380.9	$9/2^+$	E2	α(K)exp: $=1.19\times10^{-3}$ *33*. Mult.: M1, E2, but placement in the level scheme requires ΔJ=2, so M1 is ruled out.
776.9 *1*	10.3 *4*	1980.1	$7/2^-$	1203.2	$5/2^-$		
793.9 *1*	100	793.9	$5/2^-$	0.0	$1/2^-$	E2	α(K)exp: $=1.016\times10^{-3}$ *97*. Mult.: M1, E2, but placement in the level scheme requires ΔJ=2, so M1 is ruled out.
797.0 *7*	10.0 *5*	2202.6	≥7/2	1405.2	$(11/2^+,13/2^+)$		
827.3 *2*	2.2 *3*	1980.1	$7/2^-$	1153.0	$5/2^+$		
836.2 *1*	28.5 *4*	1630.1	$7/2^-$	793.9	$5/2^-$	M1,E2	α(K)exp: $=1.10\times10^{-3}$ *20*.
898.6 *2*	[‡]	2302.2	≥7/2	1405.2	$(11/2^+,13/2^+)$		
920.6 *2*	5.71 *20*	2073.4	$(7/2^+,9/2^+)$	1153.0	$5/2^+$		
940.0 *2*	3.6 *4*	2345.1	≥9/2	1405.2	$(11/2^+,13/2^+)$		
951.7 *2*	6.36 *22*	2154.8	$(9/2,11/2)^-$	1203.2	$5/2^-$		
959.7 *4*	3.67 *22*	2112.7	$5/2^+$	1153.0	$5/2^+$		
962.7 *2*	≈2.0[#]	1756.2	$5/2^-$	793.9	$5/2^-$		
962.7 *2*	≈5.2[#]	2367.9	≥9/2	1405.2	$(11/2^+,13/2^+)$		
982.9 *1*	22.7 *5*	982.9	$3/2^-$	0.0	$1/2^-$	M1,E2	α(K)exp: $=0.55\times10^{-3}$ *13*.
1024.3 *1*	89.0 *6*	1405.2	$(11/2^+,13/2^+)$	380.9	$9/2^+$	M1,E2	α(K)exp: $=0.53\times10^{-3}$ *13*. Mult.: $A_2=+0.107$ *25*, $A_4=+0.015$ *33*.
1075.3 *4*	2.23 *25*	2277.7	(7/2,9/2)	1203.2	$5/2^-$		
1182.1 *1*	14.9 *5*	1182.1	$3/2^-$	0.0	$1/2^-$		
1186.5 *3*	3.2 *5*	1980.1	$7/2^-$	793.9	$5/2^-$		
1203.1 *1*	44.8 *7*	1203.2	$5/2^-$	0.0	$1/2^-$		
1210.3 *1*	44.6 *8*	1591.5	$(11/2^+)$	380.9	$9/2^+$		$A_2=-0.130$ *25*, $A_4=+0.018$ *34*.
1215.3 *1*	29.9 *8*	2009.2	$(9/2^-,11/2^-)$	793.9	$5/2^-$		
1227.5 *1*	38.1 *7*	1608.7	$(9/2^+)$	380.9	$9/2^+$		
1392.3 *3*	2.0 *4*	2186.2	(5/2,7/2,9/2)	793.9	$5/2^-$		
1483.8 *2*	2.8 *4*	2277.7	(7/2,9/2)	793.9	$5/2^-$		
1559.7 *2*	3.3 *4*	2353.6	(7/2,9/2,11/2)	793.9	$5/2^-$		
1657.2 *1*	11.09 *23*	2038.6	(11/2,13/2)	380.9	$9/2^+$		
1692.0 *2*	6.01 *21*	2073.4	$(7/2^+,9/2^+)$	380.9	$9/2^+$		
1704.5 *4*	1.7 *3*	1704.7	$3/2^+$	0.0	$1/2^-$		
1773.5 *3*	16.4 *7*	2154.8	$(9/2,11/2)^-$	380.9	$9/2^+$		
1801.5 *2*	6.10 *23*	1801.7	$5/2^-$	0.0	$1/2^-$		
1821.4 *2*	2.98 *20*	2202.6	≥7/2	380.9	$9/2^+$		
1896.2 *3*	1.4 *3*	2277.7	(7/2,9/2)	380.9	$9/2^+$		
1921.6 *2*	7.8 *4*	2302.2	≥7/2	380.9	$9/2^+$		
1963.9 *2*	3.6 *4*	2345.1	≥9/2	380.9	$9/2^+$		
2019.2 *3*	1.31 *25*	2400.4	≥9/2	380.9	$9/2^+$		

[†] Relative photon intensity at 5.2 MeV.
[‡] Intensity is given as "weak".
[#] 1980Ta13 report I_γ=7.24 *24* for the 962.7γ doubly placed from the 1756 and 2367 levels. From Iγ(963)/(Iγ(552γ + 574γ)=0.25 for placement from the 1756 level in (p,γ), assuming that the 2367 is not populated in that reaction, one gets Iγ=2.0 and 5.2 for placements from the 1756 and 2367 levels respectively in (p,nγ).
[@] From this work.

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Level Scheme

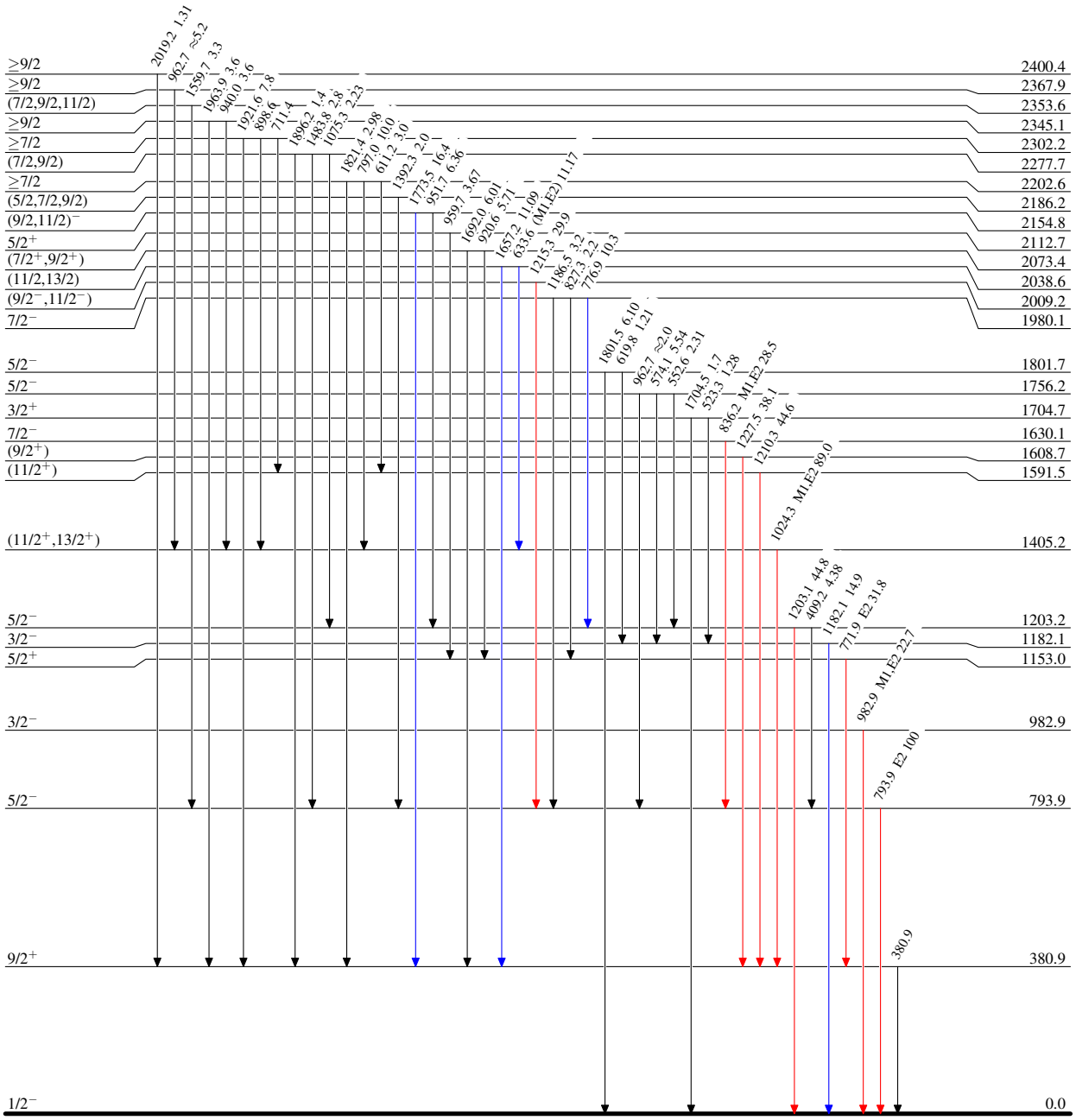
Intensities: Type not specified

Legend

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

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

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



$^{87}_{39}Y_{48}$