

$^{86}\text{Sr}(p,\gamma)$ 1975NoZT,1969Ir01,1976PiZM

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

1975NoZT: $E_p=4.3$ MeV and 4.8 MeV, anti-Compton pair spectrometer.

1969Ir01: $E_p=3930$ keV, FWHM=2 keV, pair spectrometer, measured primary γ spectra, report 5 primary γ 's.

1976PiZM: $E_p=2.8-3.8$ MeV, determined primary γ strengths.

Other: 1979Sz06: $E_p=2-3$ MeV, determined primary γ strengths.

 ^{87}Y Levels

E(level)	J^π	Comments
0.0	$1/2^-$	
380.9	$9/2^+$	
793.6	$5/2^-$	
982.6	$3/2^-$	
1152.5	$5/2^+$	
1181.5	$3/2^-$	
1202.7	$5/2^-$	
1405.1	$(7/2^+, 9/2^+)$ @	
1590.8	$11/2^+$	
1607.8	$(7/2^+, 9/2^+)$	
1625.6	$(5/2, 7/2)$	
1629.4	$(1/2^-, 3/2^-)$ @	
1704.3	$(5/2^-)$	
1755.4	$(5/2, 7/2^-)$ @	
1801.0	$(1/2^-, 3/2, 5/2^-)$	J^π : other: from comparison of primary γ strength with the γ strength to the 381 level, it follows $J^\pi=5/2^+, 7/2^-$, (1976PiZM).
1846.7	$(1/2^+, 5/2^-)$ @	J^π : $1/2^-$ in Adopted Levels.
1979.2	$(7/2, 9/2)^-$	
2072.7	$(3/2, 5/2, 7/2)$	
2073.31	$(7/2^+, 9/2^+)$	
2082.7	$(3/2)^-$	
2111.4	$5/2^+$	
2158.9		
2185# 2	$7/2^-$	
2210.4	$(1/2)$ @	
2245.4		
2279.4	$(7/2^-)$	
2292.1	$5/2^+, 7/2^+$	J^π : other: from comparison of primary γ strength with the γ strength to the 381 level, it follows $J^\pi=5/2^-$ (1976PiZM).
2354.5	$(7/2, 9/2, 11/2)$	
2376.9?		
2408.3	$3/2^+$	
2440‡	$(5/2)^+$ @	
2445# 2	$(5/2)^+$	
2507‡	$(5/2^+)$ @	
2532# 2		
2551# 2	$9/2^+$	
2572?# 2		
2579‡	$(3/2^-)$ @	E(level): Could be the 2581 level observed in 1975NoZT.
2618‡	$(3/2^-)$ @	E(level): Could be the 2616 level observed in 1975NoZT.
2668‡	$(5/2)$ @	

Continued on next page (footnotes at end of table)

⁸⁶Sr(p,γ) **1975NoZT,1969Ir01,1976PiZM (continued)**

⁸⁷Y Levels (continued)

E(level)	J ^π †	Comments
2762‡	(3/2 ⁻)@	
2908# 2	3/2 ⁺ ,5/2 ⁺	
2995# 2	(5/2 ⁺)	E(level): Could correspond to the 2995.6 keV (17/2 ⁺), 2996 keV 5/2 ⁺ , or 2996.1 keV (7/2,9/2,11/2) levels in the Adopted Levels. Evaluators assume the 5/2 ⁺ assignment at these higher energies is more likely.
3351# 2	3/2 ⁺ ,5/2 ⁺	
9644 3		E(level): proton capture level at E _p =3930 keV.

† From ⁸⁷Y Adopted Levels, unless otherwise noted.

‡ Only from 1976PiZM and only level energies reported.

From 1975NoZT, no γ's are given. Evaluator adopts Δ(E)=2 keV as these are values from the γ-ray energies determined with an accuracy of 1-2 keV from the pair spectra (1975NoZT).

@ From comparison of γ strengths to the γ strength to low lying levels (1976PiZM).

γ(⁸⁷Y)

E _i (level)	J _i ^π	E _γ ‡	I _γ †	E _f	J _f ^π	Comments
380.9	9/2 ⁺	380.86	100	0.0	1/2 ⁻	
793.6	5/2 ⁻	793.59	100	0.0	1/2 ⁻	
982.6	3/2 ⁻	982.58	100	0.0	1/2 ⁻	
1152.5	5/2 ⁺	771.57	100	380.9	9/2 ⁺	
1181.5	3/2 ⁻	1181.51	100	0.0	1/2 ⁻	
1202.7	5/2 ⁻	409.25	9	793.6	5/2 ⁻	E _γ : The authors place the 409γ tentatively from the 1202, 1509, and 2210 levels. The branching from the 1202 levels agrees with that from (p,nγ) so the evaluator assigns all the intensity to this placement. Also, the placement from the 1509 level is not confirmed in other reactions populating this level.
		1202.60	100	0.0	1/2 ⁻	
1405.1	(7/2 ⁺ ,9/2 ⁺)	1024.11	100	380.9	9/2 ⁺	
1590.8	11/2 ⁺	1209.9	100	380.9	9/2 ⁺	
1607.8	(7/2 ⁺ ,9/2 ⁺)	1226.9	100	380.9	9/2 ⁺	
1625.6	(5/2,7/2)	444.0	56	1181.5	3/2 ⁻	
		642.98	100	982.6	3/2 ⁻	
		831.97	100	793.6	5/2 ⁻	
1629.4	(1/2 ⁻ ,3/2 ⁻)	835.80	100	793.6	5/2 ⁻	
1704.3	(5/2 ⁻)	501.9	18	1202.7	5/2 ⁻	
		522.70	91	1181.5	3/2 ⁻	
		910.48	94	793.6	5/2 ⁻	
		1704.2	100	0.0	1/2 ⁻	
1755.4	(5/2,7/2 ⁻)	552.85	48	1202.7	5/2 ⁻	
		574.01	100	1181.5	3/2 ⁻	E _γ : The authors place the 574γ tentatively from the 1756 and the 1979 levels. In (p,nγ) the 574γ is placed only from the 1756 level with branching that agrees wiath that from (p,γ).
		961.6	37	793.6	5/2 ⁻	
1801.0	(1/2 ⁻ ,3/2,5/2 ⁻)	598.1	16	1202.7	5/2 ⁻	
		619.7@	35	1181.5	3/2 ⁻	
		818.52	8	982.6	3/2 ⁻	
		1801.0	100	0.0	1/2 ⁻	
1846.7	(1/2 ⁺ ,5/2 ⁻)	665.16	67	1181.5	3/2 ⁻	
		864.12	100	982.6	3/2 ⁻	
1979.2	(7/2,9/2 ⁻)	776.5	81	1202.7	5/2 ⁻	

Continued on next page (footnotes at end of table)

$^{86}\text{Sr}(p,\gamma)$ **1975NoZT,1969Ir01,1976PiZM (continued)** $\gamma(^{87}\text{Y})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\ddagger	I_γ^\dagger	E_f	J_f^π	Comments
1979.2	$(7/2,9/2)^-$	826.9	12	1152.5	$5/2^+$	E $_\gamma$: The 1279 γ was originally placed by the authors as deexciting the same 2073.31 level as the 920.29 γ and 1691.7 γ . However, as the 1279 γ was not observed in β^+ decay or (p,n γ), it is likely originating from a different level as shown by the evaluators here.
2072.7	$(3/2,5/2,7/2)$	1279.0	100	793.6	$5/2^-$	
2073.31	$(7/2^+,9/2^+)$	920.29	100	1152.5	$5/2^+$	I $_\gamma$: The spectrum from ^{87}Zr β^+ decay suggests the 920 γ has roughly half the intensity of the 1692 γ . The (p,n γ) data show the 920 γ with intensity slightly less than the 1692 γ . Therefore, it is very likely that this is a doublet, a large part of which is unplaced.
2082.7	$(3/2)^-$	1691.7	22	380.9	$9/2^+$	E $_\gamma$: The 1279 γ was originally placed by the authors as deexciting the same 2073.31 level as the 920.29 γ and 1691.7 γ . However, as the 1279 γ was not observed in β^+ decay or (p,n γ), it is likely originating from a different level as shown by the evaluators here. I $_\gamma$: The spectrum from ^{87}Zr β^+ decay suggests the 920 γ has roughly half the intensity of the 1692 γ . The (p,n γ) data show the 920 γ with intensity slightly less than the 1692 γ . Therefore, it is very likely that this is a doublet, a large part of which is unplaced.
		880.0	31	1202.7	$5/2^-$	
		901.3	97	1181.5	$3/2^-$	
		930.0@	31	1152.5	$5/2^+$	
		1100.1	53	982.6	$3/2^-$	
2082.8	100	0.0	$1/2^-$			
2111.4	$5/2^+$	706.27	55	1405.1	$(7/2^+,9/2^+)$	
		930.0@	27	1181.5	$3/2^-$	
		958.9	100	1152.5	$5/2^+$	
2158.9		2158.9	100	0.0	$1/2^-$	
2210.4	$(1/2)$	2210.4	100	0.0	$1/2^-$	
2245.4		619.7@	77	1625.6	$(5/2,7/2)$	
		1042.63	100	1202.7	$5/2^-$	
		1451.9	31	793.6	$5/2^-$	
2279.4	$(7/2^-)$	1126.9	100	1152.5	$5/2^+$	
2292.1	$5/2^+,7/2^+$	1139.6	100	1152.5	$5/2^+$	
2354.5	$(7/2,9/2,11/2)$	746.6	100	1607.8	$(7/2^+,9/2^+)$	
		949.4	47	1405.1	$(7/2^+,9/2^+)$	
2376.9?		672.6&	100	1704.3	$(5/2^-)$	
2408.3	$3/2^+$	2408.3	100	0.0	$1/2^-$	
9644		8457# 6	90#	1181.5	$3/2^-$	
		8658# 6	58#	982.6	$3/2^-$	
		8852# 6	52#	793.6	$5/2^-$	
		9267# 6	14#	380.9	$9/2^+$	
		9644# 6	100#	0.0	$1/2^-$	

† Relative photon branches from each level are from 1975NoZT, unless noted otherwise.

‡ See the (p, γ) dataset for energies from an unpublished source quoted to higher precision, but without uncertainties.

Primary γ 's observed by 1969Ir01 at $E_p=3930$ keV.

@ Multiply placed.

& Placement of transition in the level scheme is uncertain.

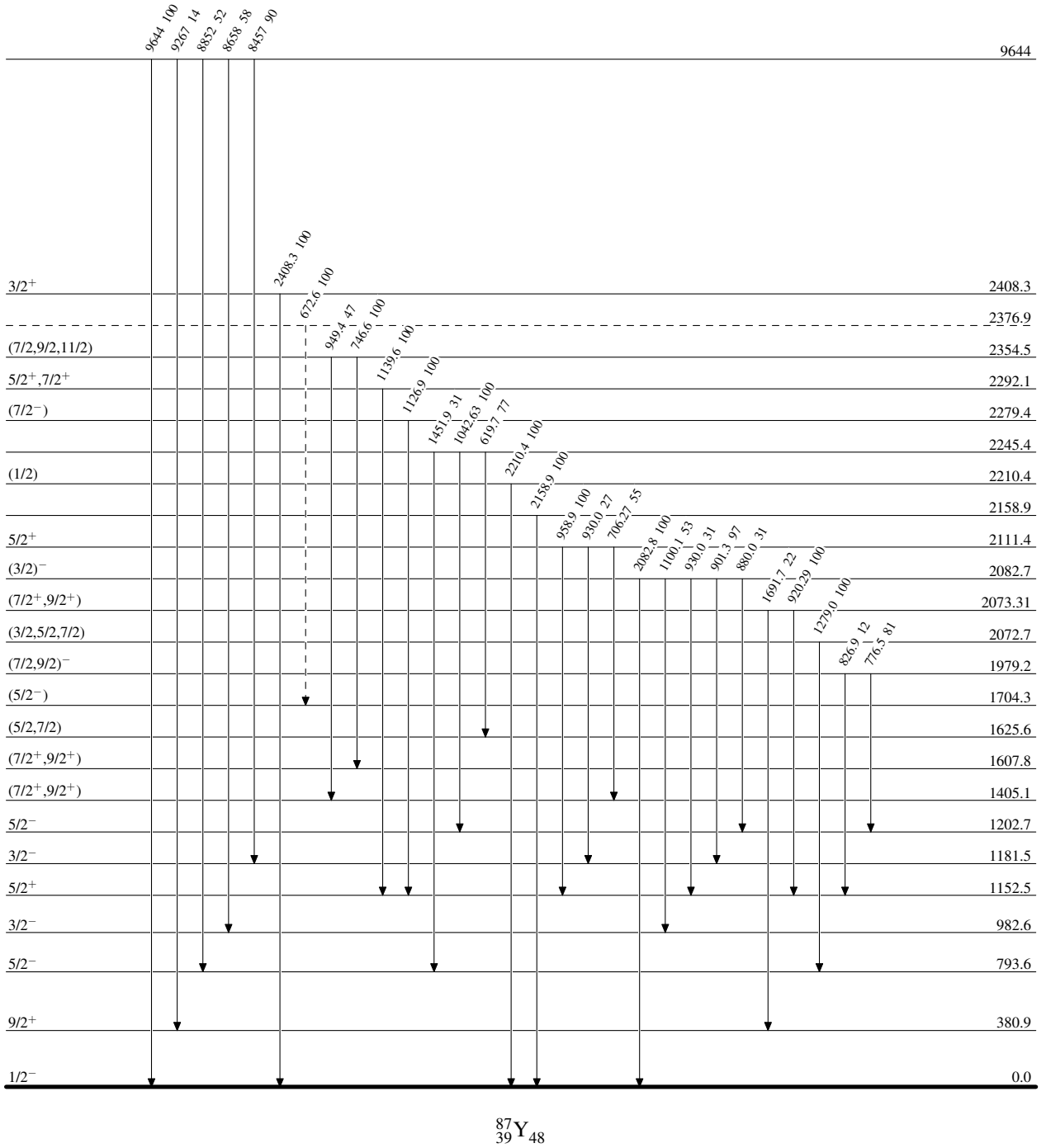
$^{86}\text{Sr}(p,\gamma)$ 1975NoZT,1969Ir01,1976PiZM

Legend

Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)

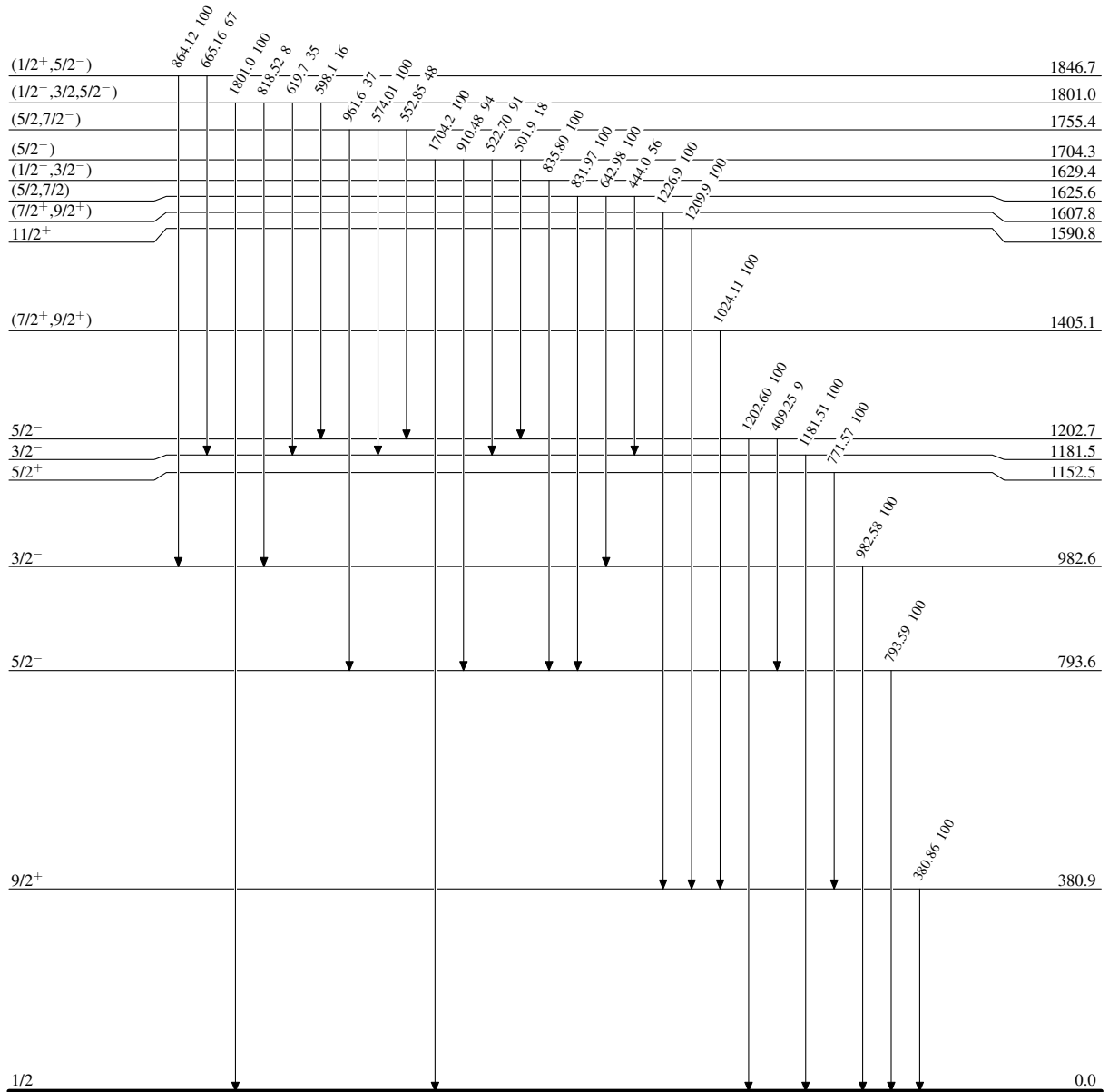


$^{87}_{39}\text{Y}_{48}$

$^{86}\text{Sr}(p,\gamma)$ 1975NoZT,1969Ir01,1976PiZM

Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{87}_{39}\text{Y}_{48}$