Adopted Levels, Gammas

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Jun Chen and Ameenah R. Farhan	NDS 194,3 (2024)	8-Jan-2024

Q(β^-)=−16000 *syst*; S(n)=15.70×10^3 *22*; S(p)=4320 *30*; Q(α)=−2730 *40* 2021Wa16
Estimated uncertainty=300 for Q(β^-) (2021Wa16).
Q(ε)=6230 *30*, S(2n)=29560 *110* (syst), S(2p)=6490 *30*, Q(εp)=2790 *40* (2021Wa16).
N=Z=38 nuclide is important from structure point-of-view, pp, nn, strong n-p correlations, waiting point nucleus in astrophysical significance, and large deformation, almost approaching superdeformation.
Identification of ^{76}Sr nuclide: 1990Li25 (in-beam γ-ray spectroscopy, also 1988NaZO and 1988LiZP), 1992Gr09 (half-life measurement), 2004De24 (half-life and delayed-proton study).
No level information is available from radioactive decay of ^{76}Y.
Mass measurements: 2005Si34 (also 2004He32), 2001La31.
2017Ka01, 2015Sa26, 2011Ro31, 2003La18, 1994Tr08: theoretical structure calculations.
Theoretical calculations: 78 primary references for structure and 15 for decay characteristics retrieved from the NSR database (www.nndc.bnl.gov/nsr/) are listed in this dataset under 'document' records.
Additional information 1.

^{76}Sr Levels

Cross Reference (XREF) Flags

- A ^{9}Be(^{76}Rb,^{76}Srγ),(^{80}Y,^{76}Srγ)
- B ^{24}Mg(^{54}Fe,2nγ)
- C ^{40}Ca(^{40}Ca,2p2nγ)

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0#	0$^+$	7.89 s *7*	ABC	%ε+%β^+=100; %εp=3.4×10^{-3} *8* (2004De24) T$_{1/2}$: multiscaling of β particles (2004De24). Other: 8.9 s *3* (1992Gr09). Weighted average of the two values is 7.94 s *22* with reduced χ^2=11; unweighted average is 8.4 s *5*. The shape of g.s. of ^{76}Sr nuclide was investigated through TAGS measurement of ^{76}Sr decay and derived β-strength function, the latter compared to the calculated shapes for oblate and prolate deformation of the g.s. of ^{76}Sr. The agreement was obtained only for the prolate shape (2004Na16 and 2013Pe13, also 2005Ru07, 2004De24, 2004Na17 and 2003Ma69). From this study estimated β_2=0.4 (2004Na16), with a definite prolate shape. This result is in agreement with β_2=0.45 *3* in 2012Le05, deduced from lifetime measurement of the first 2$^+$ state in ^{76}Sr.
262.3# *2*	2$^+$	193 ps *25*	ABC	Deformation parameter β_2=0.45 *3* (2012Le05). J$^\pi$: 262.3γ E2, ΔJ=2 to 0$^+$. T$_{1/2}$: mean lifetime τ=278 ps *36* from weighted average of τ=250 ps *44* (2020Ll01) and τ=296 ps *36* (2012Le05, T$_{1/2}$ of 205 ps *25* from T$_{1/2}$=207 ps *+16−14* at forward angles and 203 ps *+18−16* at backward angles). The values are from ^{9}Be(^{76}Rb,^{76}Srγ),(^{80}Y,^{76}Srγ) using Doppler-shift attenuation method (DSAM).
746.7# *3*	(4$^+$)		ABC	
1446.3# *4*	(6$^+$)		ABC	
2340.5# *4*	(8$^+$)		ABC	
3409.5# *11*	(10$^+$)		BC	
4629.5# *15*	(12$^+$)		BC	
5978.5# *18*	(14$^+$)		BC	
7426.6# *21*	(16$^+$)		C	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{76}Sr Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	XREF
8943.6[#] *23*	(18$^+$)	C
10536.6[#] *25*	(20$^+$)	C
12276.6[#] *27*	(22$^+$)	C
14229.6?[#] *29*	(24$^+$)	C

[†] From Eγ data.
[‡] From band assignments for levels with J≥4.
[#] Band(A): g.s. yrast band. Band crossing observed at a $\hbar\omega$=0.74 MeV *1* due to the alignment of $g_{9/2}$ proton-neutron pair, in agreement with model calculations.

$\gamma(^{76}Sr)$

E$_i$(level)	J$_i^{\pi}$	E$_\gamma$[†]	I$_\gamma$	E$_f$	J$_f^{\pi}$	Mult.	α[#]	Comments
262.3	2$^+$	262.3 *2*	100	0.0	0$^+$	E2[‡]	0.0307	B(E2)(W.u.)=120 *+18−14* E$_\gamma$: others: 261.6 *5* from (^{76}Rb,^{76}Srγ), 261.5 *3* from (^{54}Fe,2nγ).
746.7	(4$^+$)	484.4 *2*	100	262.3	2$^+$	(E2)[‡]		
1446.3	(6$^+$)	699.6 *2*	100	746.7	(4$^+$)	(E2)[‡]		E$_\gamma$: other: 697.9 *5* from (^{54}Fe,2nγ).
2340.5	(8$^+$)	894.2 *2*	100	1446.3	(6$^+$)	(E2)[‡]		E$_\gamma$: other: 893.3 *5* from (^{54}Fe,2nγ).
3409.5	(10$^+$)	1069 *1*	100	2340.5	(8$^+$)			E$_\gamma$: other: 1067 *1* from (^{54}Fe,2nγ).
4629.5	(12$^+$)	1220 *1*	100	3409.5	(10$^+$)			E$_\gamma$: other: 1218 *1* from (^{54}Fe,2nγ).
5978.5	(14$^+$)	1349 *1*	100	4629.5	(12$^+$)			E$_\gamma$: also from (^{54}Fe,2nγ).
7426.6	(16$^+$)	1448 *1*	100	5978.5	(14$^+$)			
8943.6	(18$^+$)	1517 *1*	100	7426.6	(16$^+$)			
10536.6	(20$^+$)	1593 *1*	100	8943.6	(18$^+$)			
12276.6	(22$^+$)	1740 *1*	100	10536.6	(20$^+$)			
14229.6?	(24$^+$)	1953[@] *1*	100	12276.6	(22$^+$)			

[†] From ^{40}Ca(^{40}Ca,2p2nγ). Most of corresponding values in ^{24}Mg(^{54}Fe,2nγ) are consistently lower by 1-2 keV, as given under comments.
[‡] Multipolarity is proposed as ΔJ=2, quadrupole (most likely E2) from $\gamma(\theta)$ data in ^{24}Mg(^{54}Fe,2nγ) (2001Fi13), but $\gamma(\theta)$ coefficients or $\gamma(\theta)$ plots are not provided in the paper. For the 262.3γ from the first 2$^+$ state, M2 is ruled out by RUL.
[#] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[@] Placement of transition in the level scheme is uncertain.

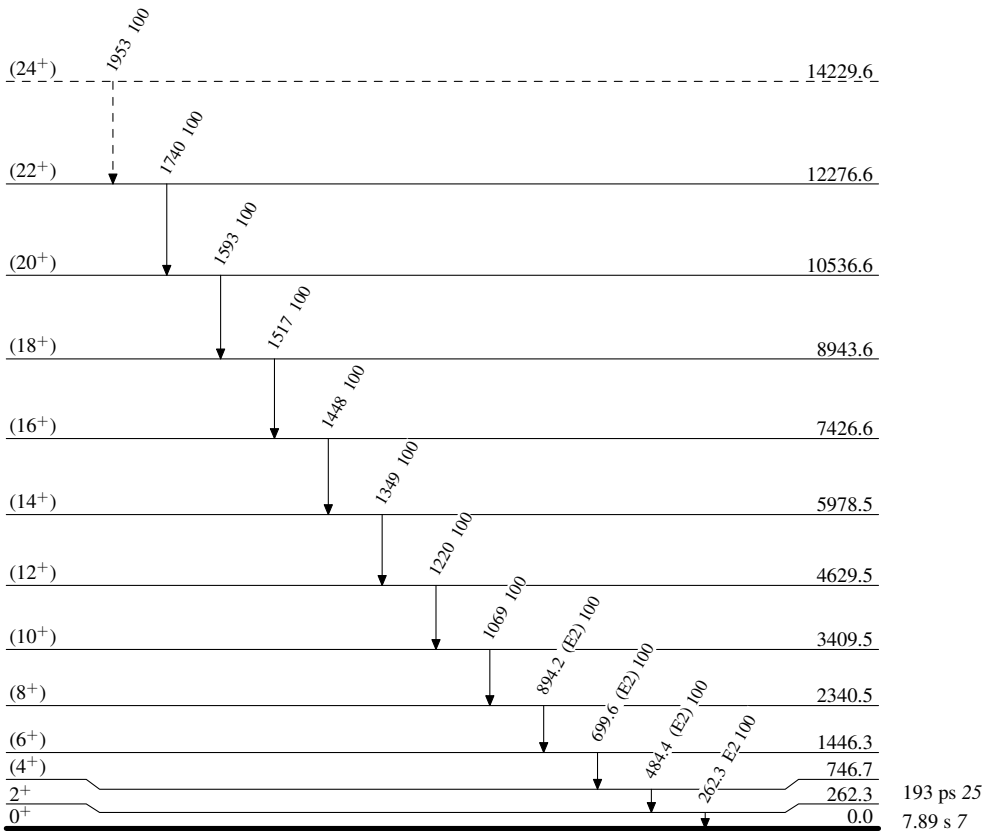
Adopted Levels, Gammas

Legend

Level Scheme

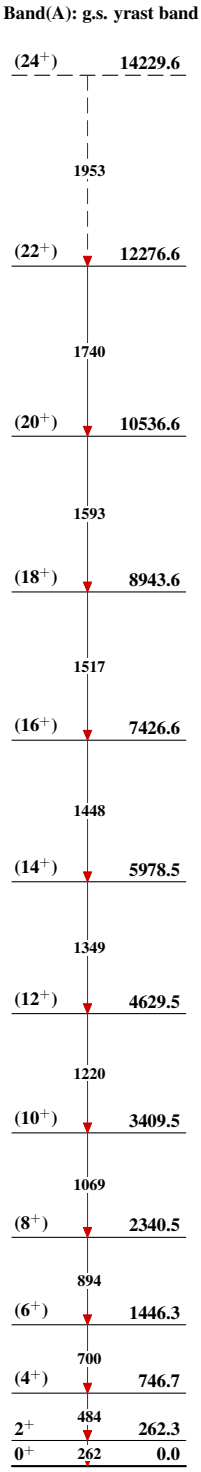
Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{76}_{38}Sr_{38}$

Adopted Levels, Gammas



$^{76}_{38}Sr_{38}$