^{80}Se(α,p2nγ),^{78}Se(α,pγ) 1986Fu04,1984Do02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 199,271 (2025)	1-Sep-2024

1986Fu04: ^{80}Se(α,p2nγ), Eα=27-48 MeV; measured excit, Eγ, Iγ, γγ coin, γ(θ), γ linear polarization, γ(t), DSAM.
1984Do02: ^{78}Se(α,pγ), Eα=27 MeV, pulsed beam; measured α-γ(t).

^{81}Br Levels

E(level)[†]	Jπ[#]	$T_{1/2}$[@]	Comments
0[&]	3/2⁻		
276.0[&] *1*	5/2⁻		
536.20[a] *14*	9/2⁺		
566.0 *10*			
836.5[&] *3*	7/2⁻		
1176.80[a] *25*	13/2⁺		
1266.4[‡][&] *3*	9/2⁻		
1945.5[&] *4*	(11/2⁻)		
2277.8[a] *11*			
2387.4?[&] *4*			
2549.3[b] *4*	(13/2⁻)		
2668.4[b] *4*	(15/2⁻)	<0.2 ns	
2942.0[b] *4*	(17/2⁻)		
3088.9? *5*			
3196.0? *5*			
3333.4[b] *4*	(19/2⁻)	0.69 ps *28*	$T_{1/2}$: from τ=1.0 ps *4* (1986Fu04 − DSAM − corrected value from assumed side feeding).
3526.8[a] *13*			
3798.6[b] *5*	(21/2⁻)		$T_{1/2}$: 0.62 ps *35* from τ=0.9 ps *5* (1986Fu04 − DSAM and not corrected for side feeding).

[†] From a least-squares fit to the γ-ray energies.
[‡] See comment on 1266 level in (n,n′γ).
[#] From 1986Fu04, based on γ(θ) and linear polarization data, deduced band structure from (α,p2nγ) reaction and analogy with isotone (^{83}Rb); authors consider these values to be likely, but tentative (1986Fu04).
[@] From DSAM, line shape analysis (1986Fu04) for 3333 level; from centroid shift of 119.1γ time distribution (1984Do02) for 2668 level.
[&] Band(A): Possible (π $p_{3/2}$) g.s. band (1986Fu04).
[a] Band(B): Possible (π $g_{9/2}$) band (1986Fu04).
[b] Band(C): Possible 3 quasiparticle band (1986Fu04); configuration probably includes at least one $g_{9/2}$ proton.

γ(^{81}Br)

Eγ[†]	Iγ[†]	E_i(level)	$J^π_i$	E_f	$J^π_f$	Mult.[‡]	α[@]	Comments
119.1 *1*	12 *1*	2668.4	(15/2⁻)	2549.3	(13/2⁻)	(M1)	0.0712	A_2=−0.26 *3*; A_4=−0.01 *5* Mult.: mult not E2 (from RUL); intraband γ.
146.9 *2*	2.8 *4*	3088.9?		2942.0	(17/2⁻)			A_2=−0.04 *5*; A_4=−0.09 *7*
[x]231 *1*	≈1							Coin with 119γ, 276γ and possibly 273γ.
[x]238.5 *2*	3.5 *7*							A_2=−0.10 *5*; A_4=+0.13 *9* Coin with 276γ, possibly with 430γ and 560γ;
254.0 *2*	1.1 *4*	3196.0?		2942.0	(17/2⁻)			A_2=+0.07 *19*
260.2 *1*	64 *3*	536.20	9/2⁺	276.0	5/2⁻	M2	0.0455	A_2=0.00 *1*; A_4=0.00 *1* Mult.: from Adopted Gammas.

Continued on next page (footnotes at end of table)

^{80}Se(α,p2nγ),^{78}Se(α,pγ) 1986Fu04,1984Do02 (continued)

γ(^{81}Br) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α@	Comments
273.6 *1*	13 *1*	2942.0	(17/2⁻)	2668.4	(15/2⁻)	M1#	0.00820	A_2=−0.21 *8* Pol=−0.21 *17*.
276.0 *1*	100 *3*	276.0	5/2⁻	0	3/2⁻	M1#	0.00803	A_2=−0.02 *1*; A_4=0.00 *1* Pol=−0.09 *4*.
290.0	≈2	566.0		276.0	5/2⁻			Iγ estimated by authors from peak containing ^{80}Kr impurity line; Eγ=290.0 *1*, Iγ=5.7 *8*, A_2=+0.33 *6*, A_4=+0.05 *8* for doublet.
391.4 *1*	6.7 *8*	3333.4	(19/2⁻)	2942.0	(17/2⁻)	(M1+E2)	0.0049 *16*	A_2=−0.46 *9* Mult.: for intraband γ; mult not E2 (from RUL).
430 *1*	≈5	1266.4	9/2⁻	836.5	7/2⁻			
441.9 *2*	3.9 *11*	2387.4?		1945.5	(11/2⁻)	D		A_2=−0.47 *14*
465.2 *2*	2.8 *8*	3798.6	(21/2⁻)	3333.4	(19/2⁻)	D		A_2=−0.28 *10*
ˣ504.9 *9*	≈2							Coin with 119γ and 276γ.
ˣ519.9 *5*	≈2							Coin with 119γ, 273γ and 276γ.
560.4 *4*	12 *2*	836.5	7/2⁻	276.0	5/2⁻			A_2=+0.07 *12*
603.8 *3*	≈2	2549.3	(13/2⁻)	1945.5	(11/2⁻)			
640.6 *2*	43 *4*	1176.80	13/2⁺	536.20	9/2⁺	E2#	1.44×10^{-3}	A_2=+0.30 *5*; A_4=−0.08 *6* Pol=0.24 *11* for γ contaminated by an ^{80}Br transition for which Pol is slightly negative; 1986Fu04 estimate Pol≈+0.4 for the 640.6γ alone.
679.4 *4*	3.2 *8*	1945.5	(11/2⁻)	1266.4	9/2⁻			A_2=−0.09 *12*
723 *1*	≈2	2668.4	(15/2⁻)	1945.5	(11/2⁻)			
836.5 *4*	5 *2*	836.5	7/2⁻	0	3/2⁻			A_2=+0.20 *18*
990.4 *3*	11 *2*	1266.4	9/2⁻	276.0	5/2⁻	Q		A_2=+0.46 *5*; A_4=−0.25 *9*
1101 *1*	≈20	2277.8		1176.80	13/2⁺			
1108.8 *5*	6 *2*	1945.5	(11/2⁻)	836.5	7/2⁻			
1120 *1*	≈7	2387.4?		1266.4	9/2⁻			
1249.0 *8*	≈7	3526.8		2277.8				
1283.0 *3*	12 *2*	2549.3	(13/2⁻)	1266.4	9/2⁻			A_2=+0.22 *15*

† From 1986Fu04.
‡ From γ(θ) and/or linear polarization (Pol) (1986Fu04). A_2 and A_4 data are listed in comments.
# Linear polarization measured (normalized assuming mult(260γ)=M2).
@ 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.
ˣ γ ray not placed in level scheme.

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Level Scheme

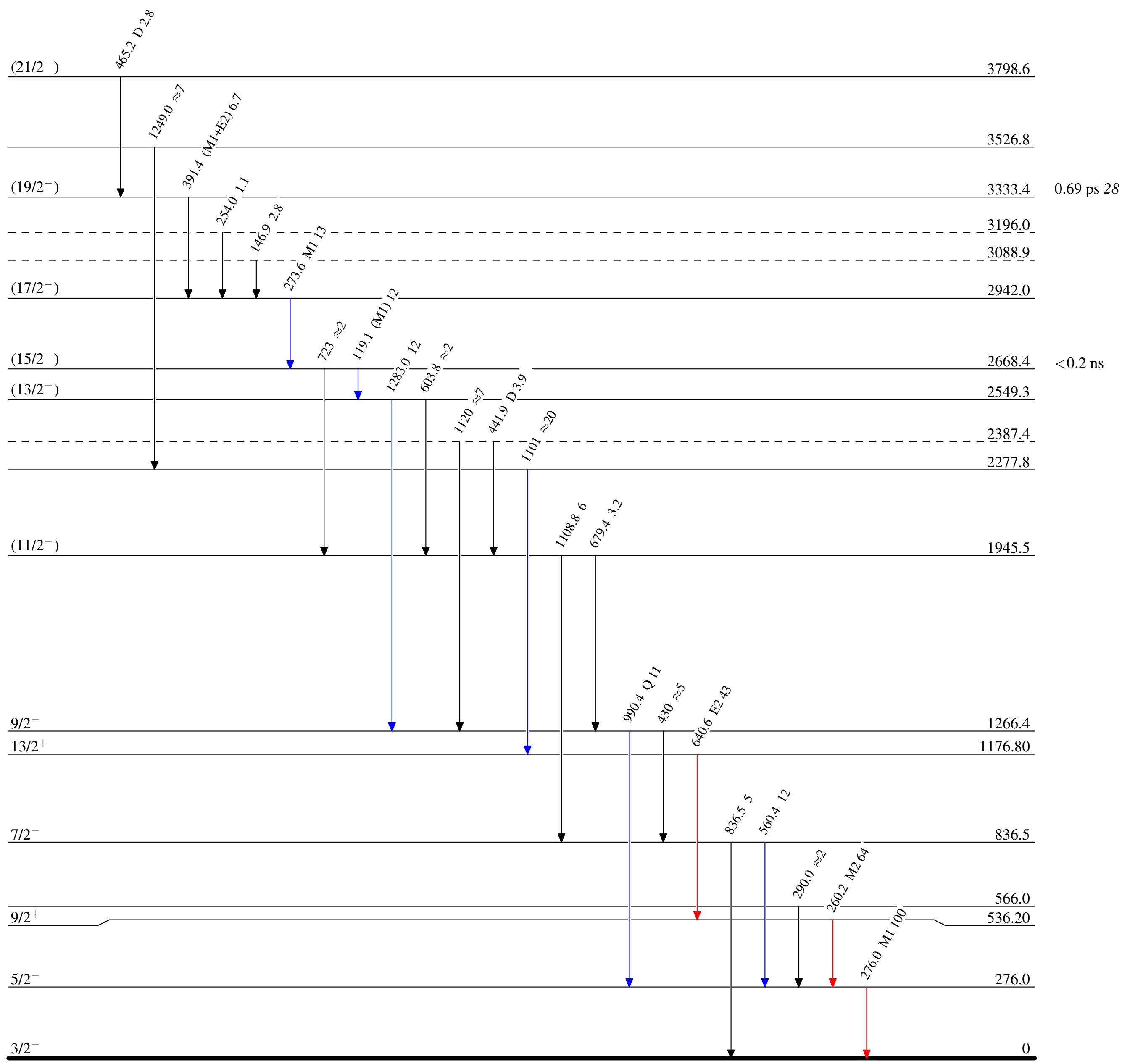
Intensities: Relative I_γ

Legend

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

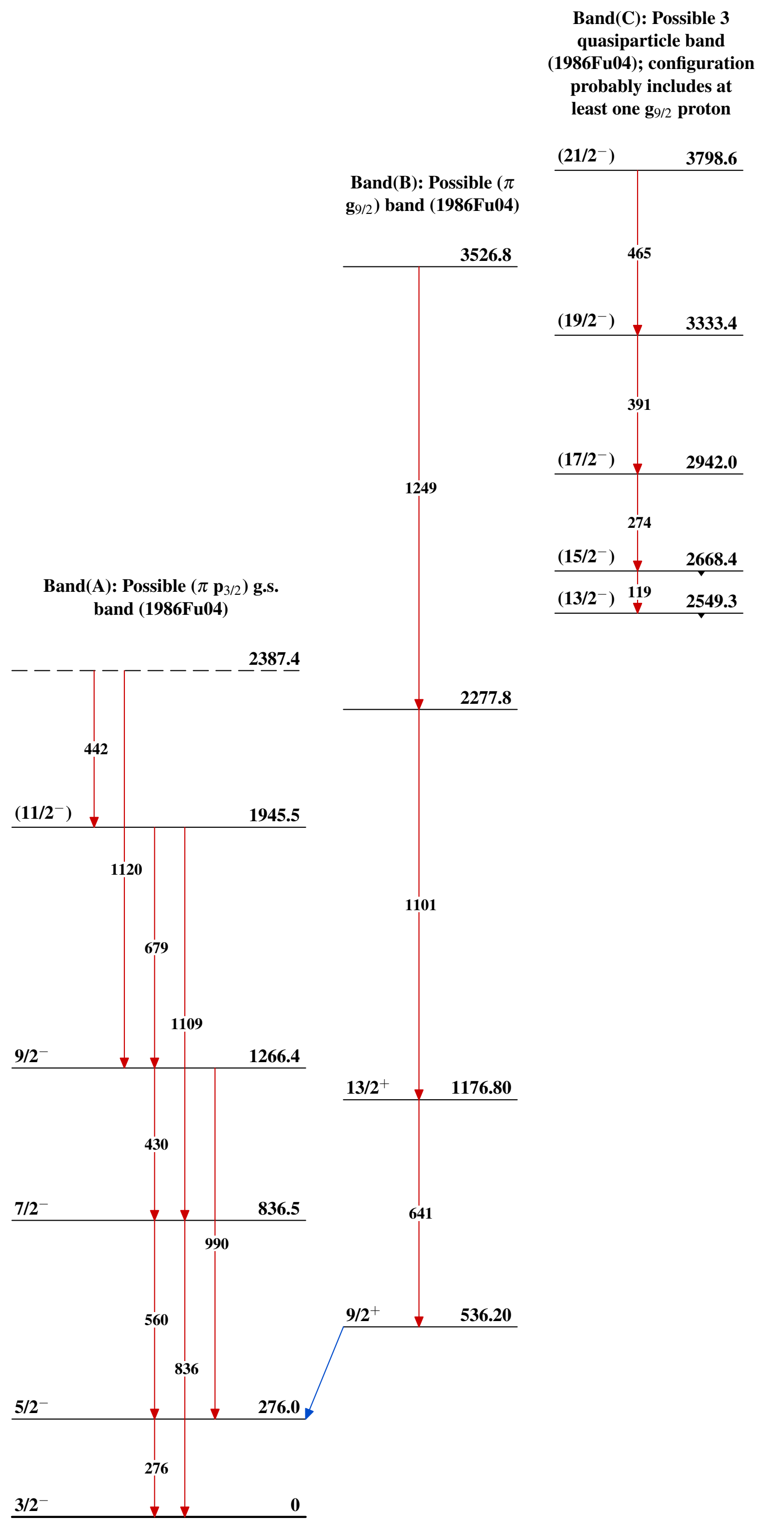
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{81}_{35}Br_{46}$

$^{80}Se(\alpha,p2n\gamma),^{78}Se(\alpha,p\gamma)$ 1986Fu04,1984Do02



$^{81}_{35}Br_{46}$