^{74}Ge(^{18}O,p3nγ),^{76}Ge(^{18}O,p5nγ) 2013Bu05,1986Wa25

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan and A. A. Sonzogni	NDS 115, 135 (2014)	1-Nov-2013

2013Bu05: ^{74}Ge(^{18}O,p3nγ) with E(^{18}O)=60 MeV and ^{76}Ge(^{18}O,p5nγ) with E(^{18}O)=90 MeV. Measured Eγ, Iγ, $\gamma\gamma\gamma$, $\gamma\gamma(\theta)$ (DCO) using Yale YRAST ball array consisting of 10 Compton-suppressed HPGe clover detectors.

1986Wa25: ^{74}Ge(^{18}O,p3nγ) with E(^{18}O)=40 MeV to 80 MeV. Measured Eγ, Iγ, $\gamma\gamma$, excitation functions, $\gamma(\theta)$, $\gamma(\theta)$ (lin pol) using three Ge(Li) detectors (FWHM=1.9 keV to 2.1 keV at 1.33 MeV), an intrinsic Ge low-energy photon spectrometer (FWHM=600 eV at 122 keV) and a Si detector (FWHM=210 eV at 6.4 keV); deduced $T_{1/2}$ using Recoil distance Doppler shift method and Doppler Shift Attenuation method (DSAM).

^{88}Y Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	E(level)[†]	J$^\pi$[‡]
0	4$^-$		3652.22 *9*	(11$^-$)	<2[#] ps	6814.88 *25*	(15)
231.93 *3*	5$^-$		3963.96 *11*	(12$^-$)	<2[#] ps	7111.9 *5*	(18)
674.55 *4*	8$^+$		4177.73 *12*	(13$^-$)	2.5[#] ps *3*	7141.9 *10*	(16)
703.87 *13*	(7)$^+$		4823.84 *15*	(14$^-$)	<0.3[@] ps	7418.7 *5*	(19)
1477.21 *7*	9$^+$		5558.24 *18*	(15)	0.10[@] ps *5*	7846.5 *10*	(17)
2312.28 *9*	(9$^+$)		5992.9 *3*	(16)		8626.8 *14*	(18)
2443.92 *9*	(10$^+$)	<2[#] ps	6264.1 *3*	(14)		9144.6? *11*	
3256.60 *9*	(10$^-$)		6536.5 *3*	(17)		9617.9? *11*	

[†] From a least-squares fit to Eγ by evaluators.
[‡] From the Adopted Levels.
[#] From Recoil distance Doppler Shift method (1986Wa25).
[@] From DSAM (1986Wa25).

γ(^{88}Y)

A_2, A_4, and POL values are from 1986Wa25. R(DCO) values from 2013Bu05; for cases where two values are indicated the first is from ^{74}Ge(^{18}O,p3nγ) with E(^{18}O)=60 MeV and the second from ^{76}Ge(^{18}O,p5nγ) with E(^{18}O)=90 MeV.

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	δ[‡]	Iγ[#]	Comments
131.4 *10*	2.7 *5*	2443.92	(10$^+$)	2312.28	(9$^+$)				
213.77[&] *4*	85 *3*	4177.73	(13$^-$)	3963.96	(12$^-$)	M1+E2	−0.09 *4*	29.1[a] *10*	R(DCO)=0.53 *2*, 0.51 *3* (E2 gated); R(DCO)=0.97 *7*, 0.96 *8* (E1 gated). A_2=−0.38 *3*, POL=−0.24 *3*.
231.929[&] *25*		231.93	5$^-$	0	4$^-$			96.6 *20*	A_2=−0.02 *2*, POL=+0.00 *2*.
306.8 *3*	3.7 *4*	7418.7	(19)	7111.9	(18)	(D)[@]			R(DCO)=0.71 *17* (E2 gated); R(DCO)=0.81 *19* (E1 gated).
311.74[&] *6*	100 *3*	3963.96	(12$^-$)	3652.22	(11$^-$)	M1+E2	−0.07 *4*	26.3 *10*	R(DCO)=0.53 *3*, 0.52 *4* (E2 gated); R(DCO)=0.99 *6*, 0.96 *8* (E1 gated). A_2=−0.34 *2*, POL=−0.26 *3*.
327.0 *10*	7.0 *5*	7141.9	(16)	6814.88	(15)	D[@]			R(DCO)=0.44 *16*, 0.50 *16* (E2 gated); R(DCO)=0.87 *23*, 1.5 *4* (E1 gated).
395.61[&] *3*	23.9 *11*	3652.22	(11$^-$)	3256.60	(10$^-$)	M1(+E2)	−0.09 *9*	5.3 *3*	A_2=−0.40 *4*.

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^{74}Ge(^{18}O,p3nγ),^{76}Ge(^{18}O,p5nγ) 2013Bu05,1986Wa25 (continued)

γ(^{88}Y) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Iγ[#]	Comments
434.7 *2*	6.2 *6*	5992.9	(16)	5558.24	(15)	D[@]			R(DCO)=0.31 *9*, 0.47 *14* (E2 gated); R(DCO)=1.0 *3*, 0.63 *11* (E1 gated).
442.62[&] *3*		674.55	8^+	231.93	5^-			77.4 *29*	A_2=+0.03 *3*, POL=+0.03 *3*.
543.6 *2*	6.2 *5*	6536.5	(17)	5992.9	(16)	D[@]			R(DCO)=0.59 *5* (E2 gated); R(DCO)=0.83 *11* (E1 gated).
550.8 *2*	2.6 *3*	6814.88	(15)	6264.1	(14)	D[@]			R(DCO)=0.59 *22* (E2 gated).
575.4 *3*	5.4 *6*	7111.9	(18)	6536.5	(17)	D[@]			R(DCO)=0.39 *16* (E2 gated); R(DCO)=0.71 *10* (E1 gated).
646.1 *1*	37.2 *14*	4823.84	(14^-)	4177.73	(13^-)	D		17[a] *3*	R(DCO)=0.57 *9*, 0.46 *6* (E2 gated); R(DCO)=0.85 *8*, 0.94 *13* (E1 gated). A_2=−0.19 *5*, POL=−0.11 *11*.
704.6 *2*	5.6 *5*	7846.5	(17)	7141.9	(16)	(D)[@]			R(DCO)=0.72 *16* (E2 gated); R(DCO)=1.2 *3* (E1 gated).
734.4 *1*	14.5 *8*	5558.24	(15)	4823.84	(14^-)	D(+Q)	−0.05 *10*	5.0 *10*	R(DCO)=0.58 *11* (E2 gated); R(DCO)=0.88 *12*, 0.79 *10* (E1 gated). A_2=−0.30 *10*, POL=+0.06 *36*.
780.3 *10*	5.0 *24*	8626.8	(18)	7846.5	(17)	D[@]			R(DCO)=0.36 *8*, 0.93 *24* (E2 gated); R(DCO)=1.32 *21* (E1 gated).
802.68[&] *6*	17.3 *24*	1477.21	9^+	674.55	8^+	M1+E2	−0.23 *12*	7.0 *5*	R(DCO)=0.92 *19*, 1.01 *16* (E1 gated). A_2=−0.59 *12*, POL=−0.08 *9*.
812.0 *10*	0.20 *8*	3256.60	(10^-)	2443.92	(10^+)				
944.3 *1*	17.6 *11*	3256.60	(10^-)	2312.28	(9^+)			2.5 *10*	
967.5 *3*	6.6 *9*	2443.92	(10^+)	1477.21	9^+				R(DCO)=1.46 *23* (E1 gated).
1208.30[&] *6*	75 *3*	3652.22	(11^-)	2443.92	(10^+)	E1(+M2)	−0.03 *5*	19.1 *8*	R(DCO)=0.54 *8*, 0.64 *7* (E2 gated). A_2=−0.28 *4*, POL=+0.17 *14*.
1608.4 *1*	15 *2*	2312.28	(9^+)	703.87	$(7)^+$				
1637.7 *1*	8.9 *7*	2312.28	(9^+)	674.55	8^+	(M1+E2)	+0.34 *8*	2.08 *20*	A_2=+0.30 *6*, POL=+0.15 *64*.
1769.3 *1*	97 *4*	2443.92	(10^+)	674.55	8^+	(E2)		23.5 *9*	Mult.: ΔJ=0, M1 also fits γ(θ) and γ(θ)(lin pol) data. R(DCO)=1.75 *8*, 1.42 *12* (E1 gated). A_2=+0.20 *1*, A_4=−0.04 *1*, POL=+0.55 *11*.
1779.3 *2*	11.8 *9*	3256.60	(10^-)	1477.21	9^+			6.0 *8*	
1991.0 *2*	5.1 *4*	6814.88	(15)	4823.84	(14^-)				
2032.6[b] *10*		9144.6?		7111.9	(18)				
2086.8 *10*	2.2 *3*	6264.1	(14)	4177.73	(13^-)				
3081.3[b] *10*		9617.9?		6536.5	(17)				

[†] From 2013Bu05, except where noted. Iγ values are from the ^{74}Ge(^{18}O,p3nγ reaction at E(^{18}O)=60 MeV, normalized to Iγ(312γ)=100.
[‡] From angular distribution and linear polarization measurements in 1986Wa25, except where noted.
[#] From 1986Wa25.
[@] From R(DCO) in 2013Bu05.

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^{74}Ge(^{18}O,p3nγ),^{76}Ge(^{18}O,p5nγ) 2013Bu05,1986Wa25 (continued)

γ(^{88}Y) (continued)

& From 1986Wa25.
[a] Obscured by contamination peak. Iγ estimated from $\gamma\gamma$.
[b] Placement of transition in the level scheme is uncertain.

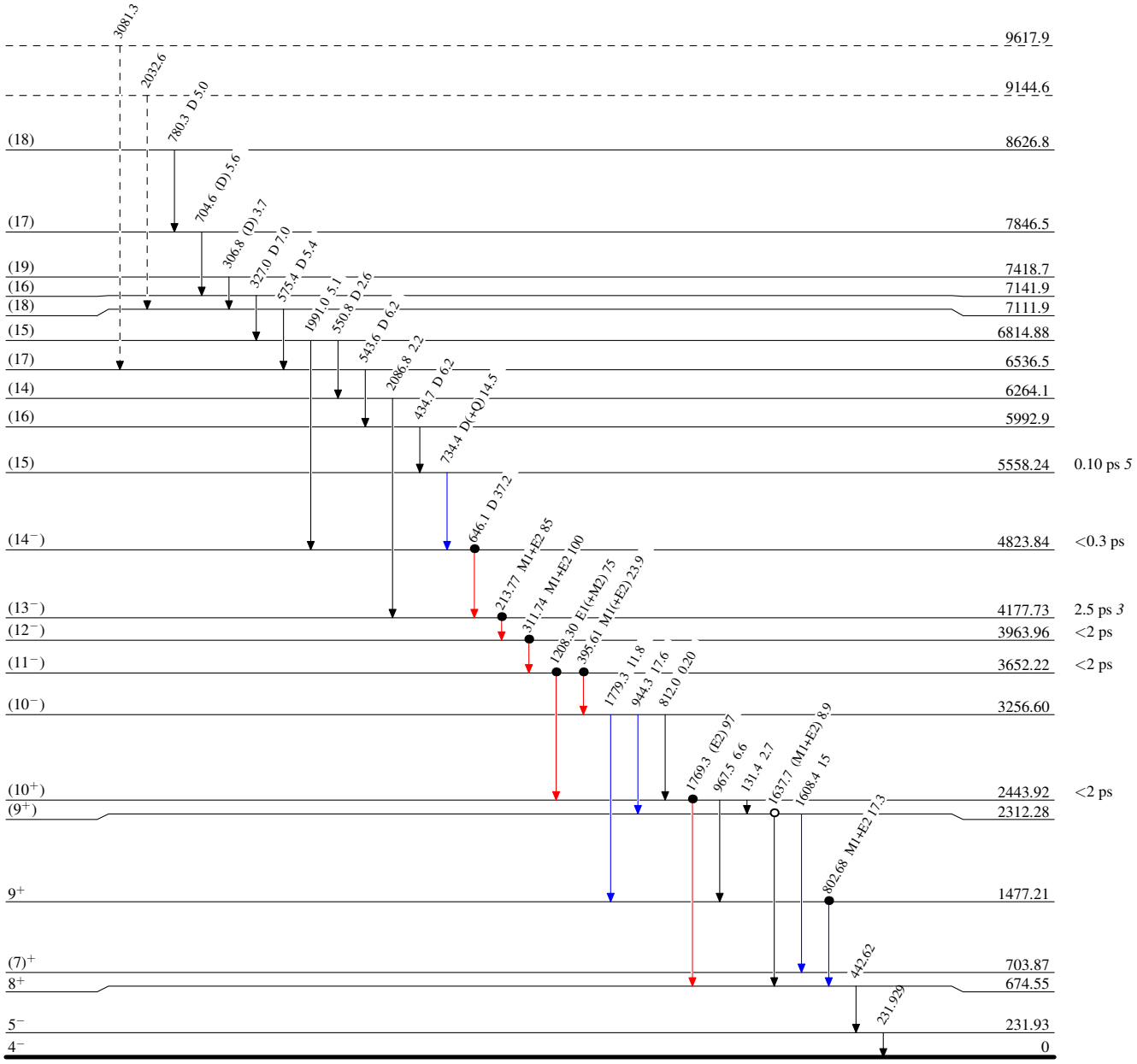
^{74}Ge(^{18}O,p3nγ),^{76}Ge(^{18}O,p5nγ) **2013Bu05,1986Wa25**

Level Scheme

Intensities: Type not specified

Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence
- Coincidence (Uncertain)



$^{88}_{39}Y_{49}$