^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

Measurements using ^{16}O(^{28}Si,αpγ):

1999AnZT (thesis, also 1999An39): E=125 MeV ^{28}Si beam was produced from the 88-inch cyclotron at the Lawrence Berkeley National Laboratory. Target was a ~0.5 mg/cm^2 self-supporting foil of ^{40}Ca^{nat}O (99.8% in ^{16}O). γ rays were detected with the GAMMASPHERE array of 83 Ge detectors, charged-particles were detected with the 4π detector array MICROBALL and neutrons were detected with 15 liquid scintillators. Measured Eγ, Iγ, γγγ-coin, γγ(θ)(DCO), αγγ-coin, pγγ-coin. Deduced levels, J, π, γ-ray multipolarities. Comparisons with shell-model calculations.

Additional information 1.

Measurements using ^{28}Si(^{16}O,αpγ):

1978Eg02: E=45 MeV ^{16}O beam was produced from the Utrecht EN tandem accelerator. Target was 250 μg/cm^2 99.91% enriched ^{28}Si on a Au backing. γ rays were detected with a NaI(Tl) Compton suppression spectrometer (CSS) and an array of three Ge(Li) detectors. Measured Eγ, Iγ, γγ-coin, γ(θ), γ(lin pol). Deduced levels, J, π, γ-ray multipolarities, branching and mixing ratios. 1978Eg02 use 346.69 *10*, 2814.24 *20*, and 3597.25 *25* from 1974Ko04 in ^{24}Mg(^{18}O,2npγ) for Eγ calibration.

1975Uh01: E=30-50 MeV ^{16}O beam was produced from the HVEC tandem accelerator of the University of Cologne. Target was a 415 μg/cm^2 natural silicon evaporated onto a Ta backing. γ rays were detected with two Ge(Li) detectors (FWHM=2.6 and 3.0 keV at E=1.33 MeV). Measured Eγ, Iγ, γγ-coin, Doppler-shift attenuation (DSA). Deduced levels, J, π, $T_{1/2}$. Comparisons with shell-model calculations. 1975Uh01 also report γ data from the measurement of ^{25}Mg(^{16}O,npγ).

1982VaZH: E=45 MeV. Compton suppressed spectrometer. Measured Eγ, γγ-coin, Doppler-shift attenuation. Deduced levels, J, π, $T_{1/2}$. Comparisons with shell-model calculations. 1982VaZH also report data on ^{25}Mg(^{16}O,npγ).

1981No05: E=42 MeV. Measured γγ-coin, recoil-distance. Deduced $T_{1/2}$ for 6475 and 8027 levels. 1981No05 report data mostly on ^{36}Ar(α,pγ) and also data on ^{24}Mg(^{18}O,2npγ) at E=42 MeV.

^{39}K Levels

E(level)†	Jπ#	$T_{1/2}$&	Comments
0	$3/2^+$		
2813.6[a] *6*	$7/2^-$	43 ps *4*	
3596.5 *6*	$9/2^-$	35 ps *3*	
3943.2[a] *6*	$11/2^-$	7.9 ps *11*	
4518.5 *10*	$9/2^-$		
5352.5 *7*	$11/2^-$		
5716.5 *7*	$13/2^-$	<2.1 ps	
6005.4 *7*	$11/2^-$		
6433.8 *7*	$13/2^+$	<7 ns	$T_{1/2}$: from γγ(t) in 1978Eg02. E(level): the ordering of the 1342-2490 cascade is not established in 1978Eg02 but the ordering given here is confirmed in later work of 1999AnZT.
6473.6 *7*	$15/2^+$	8.3 ps *4*	$T_{1/2}$: other: 8.3 ps *14* from 1981No05 using RDM.
7140.8[a] *7*	$15/2^-$	<3.5 ps	$T_{1/2}$: from 1978Eg02, determined from measured line shape of 3197γ in a separate experiment of ^{27}Al+^{14}N reaction with E(^{14}N)=33 MeV.
7567.6 *7*	$15/2^{(+)}$		
7775.7 *7*	$17/2^+$	2.3 ps *12*	E(level): doublet near this energy proposed by 1981No05 in (α,pγ) is not supported by detailed γ-ray studies of 1982VaZH. $T_{1/2}$: from DSAM (1982VaZH); 1301 and 1342 γ rays have the same Doppler shapes thus no lifetime difference is found as claimed by 1981No05 in (α,pγ).
8008.9 *8*	$(13/2^-)$		Jπ: $(15/2^-)$ in Adopted Levels.
8018.6?‡ *12*			
8027.7[a] *7*	$19/2^-$	13.7 ps *7*	$T_{1/2}$: from DSAM using 886.59γ in 1975Uh01. Note that ordering of 887-3197 cascade is reversed in 1975Uh01. Other: 13.2 ps *21* from 1981No05 using recoil-distance method (RDM).
8681.4 *8*	$(15/2^+)$		
9271.1 *8*	$19/2^{(-)}$		

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^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01 (continued)

^{39}K Levels (continued)

E(level)[†]	Jπ[#]	$T_{1/2}$[&]	Comments
9363.8 *7*	17/2(+)		
9908.0 *8*	21/2(−)	<1.4 ps	Jπ: (21/2+) in Adopted Levels. $T_{1/2}$: from DSAM in 1982VaZH.
10264.4 *9*	(17/2−)		Jπ: (19/2−) in Adopted Levels.
10278.5 *9*	19/2[@]		
10303.6 *8*	19/2(+)		
10383.4 *8*	19/2[@]		
10882.9[‡] *10*			
10997.5[a] *8*	23/2(−)		
11590.6 *13*	(19/2+)		
11691.2 *8*	21/2(+)		
12069.5 *8*	23/2[@]		
12209.5 *8*	23/2(−)		
12355.7[‡] *12*			
12616.1[‡] *15*			
12893.6[‡] *11*			
13010.0 *11*			
13266.1 *8*	25/2[@]		
13506.9 *12*	(23/2−)		
13776.9 *14*			
14061.1 *8*	27/2[@]		
14866.0 *12*			
16140.2 *15*			
18531.6 *14*			
18611.9 *13*			

[†] From a least-squares fit to γ-ray energies.
[‡] From 1999AnZT only.
[#] As proposed by 1999AnZT based on γγ(θ) data, decay modes and general assumption of ascending spins with excitation energy. Most assignments are the same as in Adopted Levels, except that parentheses are added by the evaluators when strong arguments are lacking, differences in assignments are pointed out.
[@] Positive parity given in 1999AnZT.
[&] From DSAM in 1975Uh01, unless otherwise noted.
[a] Band(A): γ sequence based on 7/2− (1999AnZT).

γ(^{39}K)

DCO ratios under comments are from 1999AnZT and correspond to data at 30° and 83° with gates on ΔJ=2, Q transitions of 887, 1130 and 2813 keV. Typical DCO values are ~1.0 for stretched quadrupole ΔJ=2 transitions and 0.5-0.6 or >1.3 for pure stretched dipole ΔJ=1 transitions. Quoted values of DCO1, DCO2 and DCO3 correspond to gate transitions of 887, 1130 and 2813, respectively.
Relative intensities relative to 100 for 2813.0γ are given under comments.

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[@]	Comments
2813.6	7/2−	2813.0 *7*	100	0	3/2+	M2+E3	+0.16 *2*	E_γ: other: 2814.24 *20* used in calibration in 1978Eg02.

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^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01 (continued)

γ(^{39}K) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[@]	Comments
								Relative intensity: 100 *3* (1999AnZT), 100 (1975Uh01), 100 *4* (1978Eg02). δ: other: δ=+0.50 *9* excluded from Adopted Gammas. DCO2=1.02 *5*, DCO1=0.98 *5* (1999AnZT). A_2=+0.422 *9*, A_4=−0.026 *9*, POL=−0.48 *6* (1978Eg02).
3596.5	9/2−	783.22 *11*	100 *3*	2813.6	7/2−	M1+E2	+0.69 *8*	E_γ: from 1978Eg02. Other: 782.7 *2* from 1999AnZT. I_γ: from 1978Eg02. Others: 100 *4* from 1999AnZT and 1975Uh01, Relative intensity: 23.3 *10* (1975Uh01), 25.7 *7* (1978Eg02), 51 *2* (1999AnZT). Note that Iγ(783)/Iγ(3597)=51/28 in 1999AnZT is largely discrepant with 23.3/22.8 in 1975Uh01 and 25.7/24.3 in 1978Eg02, as well as ratios in other γ-ray studies. DCO3=1.14 *6*, DCO1=1.18 *7* (1999AnZT). A_2=+0.511 *15*, A_4=+0.049 *15*, POL=−0.61 *6* (1978Eg02).
		3597.0 *9*	98 *4*	0	3/2+	E3		E_γ: other: 3597.25 *25* used in calibration in 1978Eg02. I_γ: from 1975Uh01. Others: 94 *11* from 1978Eg02, 55 *2* from 1999AnZT. Relative intensity: 22.8 *9* (1975Uh01), 24.3 *29* (1978Eg02), 28 *1* (1999AnZT). See also comment for 783.22γ. A_2=+0.590 *20*, A_4=0, POL=+0.50 *12* (1978Eg02).
3943.2	11/2−	346.7 *1*	58.3 *13*	3596.5	9/2−	M1(+E2)	+0.006 *12*	E_γ: other: 346.69 *10* used in calibration in 1978Eg02. I_γ: from 1978Eg02. Others: 59 *8* from 1975Uh01 and 69 *3* from 1999AnZT. Relative intensity: 30 *4* (1975Uh01), 37.3 *9* (1978Eg02), 50 *2* (1999AnZT). DCO3=0.66 *3*, DCO1=0.62 *3* (1999AnZT). A_2=−0.229 *12*, A_4=0, POL=−0.32 *2* (1978Eg02).
		1129.88 *11*	100 *3*	2813.6	7/2−	E2		E_γ: weighted average of 1129.9 *3* (1999AnZT) and 1129.88 *11* (1978Eg02). I_γ: from 1999AnZT and 1978Eg02. Other: 100 *10* from 1975Uh01. Relative intensity: 51 *5* (1975Uh01), 64.0 *21* (1978Eg02), 72 *2* (1999AnZT). DCO3=1.04 *5*, DCO1=1.09 *5* (1999AnZT). A_2=+0.34 *3*, A_4=−0.08 *3*, POL=+0.50 *3* (1978Eg02).
4518.5	9/2−	922		3596.5	9/2−			
5352.5	11/2−	834		4518.5	9/2−			
		1409.77 *11*	100 *4*	3943.2	11/2−	M1+E2[#]	+0.2 *2*	E_γ: weighted average of 1409.5 *4* (1999AnZT) and 1409.79 *11* (1978Eg02). I_γ: from 1999AnZT. Other: 100 *6* from 1978Eg02. Relative intensity: 23.7 *14* (1978Eg02), 28 *1* (1999AnZT). DCO3=1.25 *8*, DCO2=0.93 *6*, DCO1=0.91

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^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01 (continued)

γ(^{39}K) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[@]	Comments
								5 (1999AnZT). A_2=+0.44 *3*, A_4=−0.07 *4*, POL=+0.63 *15* (1978Eg02).
5716.5	13/2$^-$	364.1 *1*	1.9 *2*	5352.5	11/2$^-$	D+Q		I_γ: other: Iγ(364)/Iγ(1773)=2/98 (1982VaZH). Relative intensity: 1.1 *1* (1999AnZT). DCO2=0.45 *11*, DCO3=0.94 *22* (1999AnZT).
		1773.98 *11*	100 *3*	3943.2	11/2$^-$	D+Q		E_γ: from 1978Eg02. Other: 1773.2 *4* from 1999AnZT. Relative intensity: 59 *2* (1999AnZT), 15 *4* (1975Uh01), 29 *3* (1978Eg02). DCO3=0.86 *5*, DCO2=0.88 *5* (1999AnZT). POL=−0.44 *15* (1978Eg02).
6005.4	11/2$^-$	2062.1 *5*	100	3943.2	11/2$^-$	D[#]		Relative intensity: 5.4 *2* (1999AnZT). DCO3=1.19 *19*, DCO2=1.29 *18* (1999AnZT).
6433.8	13/2$^+$	2490.06 *11*	100	3943.2	11/2$^-$	E1		E_γ: from 1978Eg02. Other: 2490.0 *6* from 1999AnZT. Relative intensity: 28 *1* (1999AnZT), 6.4 *3* (1978Eg02). DCO3=0.66 *5*, DCO2=0.62 *4* (1999AnZT). A_2=−0.230 *20*, A_4=−0.040 *20*, POL=+0.44 *10* (1978Eg02).
6473.6	15/2$^+$	756.84 *11*	100	5716.5	13/2$^-$	E1(+M2)	+0.002 *15*	E_γ: weighted average of 756.8 *2* (1999AnZT) and 756.85 *11* (1978Eg02). Relative intensity: 42 *1* (1999AnZT), 25.0 *9* (1978Eg02), 18 *4* (1975Uh01). DCO3=0.62 *3*, DCO2=0.73 *3* (1999AnZT). A_2=−0.250 *10*, A_4=0, POL=+0.34 *2* (1978Eg02).
7140.8	15/2$^-$	1134.6		6005.4	11/2$^-$			
		1423.41 *14*	12.0 *3*	5716.5	13/2$^-$	D+Q		E_γ: from 1978Eg02. Other: 1426.6 *4* from 1999AnZT. I_γ: others: 7.4 *11* from 1978Eg02; Iγ(1423):Iγ(3197)=6.0 *15*:60 (1982VaZH). Relative intensity: 4.2 *1* (1999AnZT), 1.0 *2* (1978Eg02). DCO3=0.98 *17* (1999AnZT).
		1787.69 *14*	77 *3*	5352.5	11/2$^-$	E2		E_γ: weighted average of 1788.2 *4* (1999AnZT) and 1787.65 *11* (1978Eg02). I_γ: other: 55 *3* (1978Eg02); Iγ(1788):Iγ(3197)=34:60 (1982VaZH). Relative intensity: 27 *1* (1999AnZT), 7.4 *4* (1978Eg02). DCO3=1.26 *11*, DCO2=1.19 *11*, DCO1=1.13 *6* (1999AnZT). A_2=+0.380 *20*, A_4=−0.140 *20*, POL=+0.69 *9* (1978Eg02).
		3197.18 *26*	100 *3*	3943.2	11/2$^-$	E2		E_γ: weighted average of 3196.7 (1999AnZT) and 3197.23 *26* (1978Eg02). I_γ: other: 100 *6* from 1978Eg02. Relative intensity: 35 *1* (1999AnZT), 13.6 *9* (1978Eg02). DCO3=1.17 *7*, DCO2=1.15 *7*, DCO1=1.10 *6* (1999AnZT). A_2=+0.37 *4*, A_4=−0.11 *3*, POL=+0.4 *3* (1978Eg02).

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^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01 (continued)

γ(^{39}K) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[@]	Comments
7567.6	15/2$^{(+)}$	1094.3 *3*	100 *4*	6473.6	15/2$^+$	D[#]		Relative intensity: 5.2 *2* (1999AnZT). DCO3=1.28 *13* (1999AnZT).
		1849.8 *5*	69 *2*	5716.5	13/2$^-$	D		Relative intensity: 3.6 *1* (1999AnZT). DCO3=0.71 *13* (1999AnZT).
7775.7	17/2$^+$	635.8 *2*	3.3 *4*	7140.8	15/2$^-$	D		E_γ: poor fit. Level-energy difference=635.0. Relative intensity: 0.8 *1* (1999AnZT). DCO3=0.7 *4* (1999AnZT).
		1301.18 *11*	83 *4*	6473.6	15/2$^+$	M1+E2	−0.9 *3*	E_γ: from 1978Eg02. Other: 1301.2 *3* from 1999AnZT. I_γ: other: Iγ(1301)/Iγ(1342)=34 *8*/66 *8* (1978Eg02). Relative intensity: 20 *1* (1999AnZT), 3.29 *14* (1978Eg02). A_2=−0.970 *20*, A_4=+0.13 *3*, POL=+0.26 *9* (1978Eg02). DCO3=0.27 *2*, DCO2=0.35 *5* (1999AnZT).
		1341.8 *3*	100 *4*	6433.8	13/2$^+$	Q		Relative intensity: 24 *1* (1999AnZT), <6.4 *5* for a doublet (1978Eg02). DCO3=1.13 *7*, DCO2=1.06 *6* (1999AnZT).
8008.9	(13/2$^-$)	2004		6005.4	11/2$^-$			E_γ: from 1999An39, 2044.0 in 1999AnZT is a misprint.
		2655.0		5352.5	11/2$^-$			
		4066.1 *10*	100 *4*	3943.2	11/2$^-$	(Q)		Relative intensity: 2.5 *1* (1999AnZT). DCO2=1.3 *4* (1999AnZT).
8018.6?		1545[&]		6473.6	15/2$^+$			
8027.7	19/2$^-$	252.08 *8*	12.5 *5*	7775.7	17/2$^+$	E1		E_γ: weighted average of 252.1 *1* (1999AnZT) and 252.06 *8* (1978Eg02). I_γ: weighted average of 12.9 *5* (1999AnZT) and 11.9 *6* (1978Eg02). Relative intensity: 5.8 *2* (1999AnZT), 2.71 *14* (1978Eg02). DCO3=0.63 *5*, DCO2=0.79 *7* (1999AnZT). A_2=−0.239 *11*, A_4=0, POL=+0.36 *12* (1978Eg02).
		886.59 *11*	100 *2*	7140.8	15/2$^-$	E2		E_γ: weighted average of 886.6 *2* (1999AnZT) and 886.58 *11* (1978Eg02). I_γ: other: 100 *4* from 1978Eg02. Relative intensity: 45 *1* (1999AnZT), 22.9 *9* (1978Eg02), 17 *3* from 1975Uh01. DCO3=1.20 *6*, DCO2=1.07 *5* (1999AnZT). A_2=+0.358 *15*, A_4=−0.133 *15*, POL=+0.62 *3* (1978Eg02). I_γ: 17 *3* from 1975Uh01.
8681.4	(15/2$^+$)	1113.0		7567.6	15/2$^{(+)}$			
		2207.6 *6*	100 *4*	6473.6	15/2$^+$			Relative intensity: 5.2 *2* (1999AnZT).
9271.1	19/2$^{(-)}$	2130.4 *5*	100	7140.8	15/2$^-$	Q		Relative intensity: 11 *1* (1999AnZT). DCO3=1.40 *17*, DCO2=1.05 *10* (1999AnZT).
9363.8	17/2$^{(+)}$	682.3 *2*	25.0 *17*	8681.4	(15/2$^+$)	D+Q		Relative intensity: 1.5 *1* (1999AnZT). DCO3=0.78 *10* (1999AnZT).
		2891.2 *7*	100 *3*	6473.6	15/2$^+$	D+Q		Relative intensity: 6.0 *2* (1999AnZT). DCO3=0.95 *12*, DCO2=1.8 *3* (1999AnZT).
9908.0	21/2$^{(-)}$	1880.6 *5*	100	8027.7	19/2$^-$	D+Q		Relative intensity: 16 *1* (1999AnZT). DCO3=1.23 *11*, DCO2=1.23 *9*, DCO1=1.11 *6* (1999AnZT).
		2131.6 *14*		7775.7	17/2$^+$			E_γ: from 1982VaZH only.

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^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01 (continued)

γ(^{39}K) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	Comments
							I_γ: Iγ(2133)/Iγ(1881)=40 *10*/60 *10* (1982VaZH).
10264.4	(17/2$^-$)	2255.5 *6*	100 *3*	8008.9	(13/2$^-$)	Q	Relative intensity: 6.2 *2* (1999AnZT). DCO3=0.93 *18* (1999AnZT).
		3123.5 *8*	67.7 *16*	7140.8	15/2$^-$	Q	Relative intensity: 4.2 *1* (1999AnZT). DCO3=0.96 *14*, DCO2=0.97 *13* (1999AnZT).
10278.5	19/2	914		9363.8	17/2$^{(+)}$	D+Q	DCO3=1.09 *22* (1999AnZT).
		2503		7775.7	17/2$^+$		
		2710		7567.6	15/2$^{(+)}$		
10303.6	19/2$^{(+)}$	939.8 *2*	10 *1*	9363.8	17/2$^{(+)}$	D+Q	Relative intensity: 1.5 *1* (1999AnZT). DCO3=0.69 *16* (1999AnZT).
		2527.2 *6*	100 *7*	7775.7	17/2$^+$	D+Q	Relative intensity: 15 *1* (1999AnZT). DCO=1.543 *12*, DCO2=1.54 *14* (1999AnZT).
10383.4	19/2	2607.8 *7*	100 *3*	7775.7	17/2$^+$	D+Q	Relative intensity: 6.0 *2* (1999AnZT). DCO3=0.90 *12*, DCO2=1.39 *22* (1999AnZT).
		3908		6473.6	15/2$^+$	Q	DCO3=1.2 *3* (1999AnZT).
10882.9		3315.1[&] *8*	100 *6*	7567.6	15/2$^{(+)}$		Relative intensity: 1.8 *1* (1999AnZT).
		4409.2[&] *11*	67 *6*	6473.6	15/2$^+$		Relative intensity: 1.2 *1* (1999AnZT).
10997.5	23/2$^{(-)}$	1727		9271.1	19/2$^{(-)}$		
		2969.9 *7*	100 *6*	8027.7	19/2$^-$	Q	Relative intensity: 16 *1* (1999AnZT). DCO3=1.09 *8*, DCO2=1.20 *10*, DCO1=1.29 *8* (1999AnZT).
11590.6	(19/2$^+$)	2909		8681.4	(15/2$^+$)	Q	DCO3=1.4 *3* (1999AnZT).
11691.2	21/2$^{(+)}$	3914.8 *10*	100 *4*	7775.7	17/2$^+$	Q	Relative intensity: 2.3 *1* (1999AnZT). DCO2=1.8 *6* (1999AnZT).
12069.5	23/2	378.3 *1*	13.6 *12*	11691.2	21/2$^{(+)}$	D+Q	Relative intensity: 1.1 *1* (1999AnZT). DCO2=0.36 *8*, DCO3=0.37 *16* (1999AnZT).
		1685.9 *4*	100 *3*	10383.4	19/2	Q	Relative intensity: 8.1 *2* (1999AnZT). DCO3=1.16 *12*, DCO2=1.04 *14* (1999AnZT).
		1766		10303.6	19/2$^{(+)}$		
		1790		10278.5	19/2		
12209.5	23/2$^{(-)}$	1212.3 *3*	37.2 *23*	10997.5	23/2$^{(-)}$		Relative intensity: 1.6 *1* (1999AnZT).
		2301.8 *6*	100 *2*	9908.0	21/2$^{(-)}$	D+Q	Relative intensity: 4.3 *1* (1999AnZT). DCO1=0.66 *8* (1999AnZT).
		4181.2 *10*	74.4 *23*	8027.7	19/2$^-$		Relative intensity: 3.2 *1* (1999AnZT).
12355.7		3084.5[&] *8*	100	9271.1	19/2$^{(-)}$		Relative intensity: 4.9 *2* (1999AnZT). DCO3=0.84 *15*, DCO2=1.5 *3* (1999AnZT).
12616.1		4607.0[&] *12*	100	8008.9	(13/2$^-$)		Relative intensity: 0.2 *1* (1999AnZT).
12893.6		2010.6[&] *5*	100	10882.9			Relative intensity: 4.6 *2* (1999AnZT).
13010.0		2745.5 *7*	100	10264.4	(17/2$^-$)		Relative intensity: 5.0 *2* (1999AnZT). DCO3=1.7 *3*, DCO2=1.10 *15* (1999AnZT).
13266.1	25/2	1057.1 *3*	41.7 *12*	12209.5	23/2$^{(-)}$	D	Relative intensity: 3.5 *1* (1999AnZT). DCO3=0.80 *13*, DCO1=0.58 *7* (1999AnZT).
		1196.3 *3*	100 *4*	12069.5	23/2	D+Q	Relative intensity: 8.4 *3* (1999AnZT). DCO3=0.55 *5*, DCO2=0.78 *5* (1999AnZT).
		2266		10997.5	23/2$^{(-)}$		
13506.9	(23/2$^-$)	3599		9908.0	21/2$^{(-)}$	D+Q	DCO3=1.7 *4*, DCO2=1.44 *22* (1999AnZT).
13776.9		2186.3 *5*	100	11590.6	(19/2$^+$)		Relative intensity: 5.9 *2* (1999AnZT).
14061.1	27/2	794.9 *2*	83.9 *23*	13266.1	25/2	D+Q	Relative intensity: 7.3 *2* (1999AnZT). DCO3=0.80 *7*, DCO2=0.78 *7*, DCO1=0.99 *14* (1999AnZT).
		1991.7 *5*	100 *4*	12069.5	23/2	Q	Relative intensity: 8.7 *3* (1999AnZT). DCO3=1.11 *16* (1999AnZT).
14866.0		3868.0 *10*	100	10997.5	23/2$^{(-)}$		Relative intensity: 5.0 *2* (1999AnZT). DCO2=1.23 *20* (1999AnZT).

Continued on next page (footnotes at end of table)

^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01 (continued)

γ(^{39}K) (continued)

E_i(level)	E_γ[†]	I_γ[†]	E_f	J^π_f	Comments
16140.2	3130		13010.0		
18531.6	4470.3 *11*	100	14061.1	27/2	Relative intensity: 2.9 *1* (1999AnZT).
18611.9	3745.5[&] *9*	100 *5*	14866.0		Relative intensity: 2.2 *1* (1999AnZT).
	5105.2 *13*	32 *5*	13506.9	(23/2$^-$)	Relative intensity: 0.7 *1* (1999AnZT).

[†] From 1999AnZT, unless otherwise noted. Quoted values of Iγ are relative branchings from each level. Original values of relative intensities from the source papers are given under comments. Note that intensities in 1999AnZT and 1975Uh01 are relative to Iγ(2813.0γ)=100 *3* and 100, respectively, and original values in 1978Eg02 are relative to Iγ(2813.0γ)=70 *3*. The evaluator has re-normalized values in 1978Eg02 to Iγ(2813.0γ)=100 *4*.

[‡] From $\gamma(\theta)$ and γ(lin pol) in 1978Eg02, $\gamma\gamma(\theta)$(DCO) in 1999AnZT; mult=D or D+Q implies ΔJ=1, unless otherwise stated; mult=Q implies ΔJ=2.

[#] ΔJ=0, dipole transition from DCO (1999AnZT).

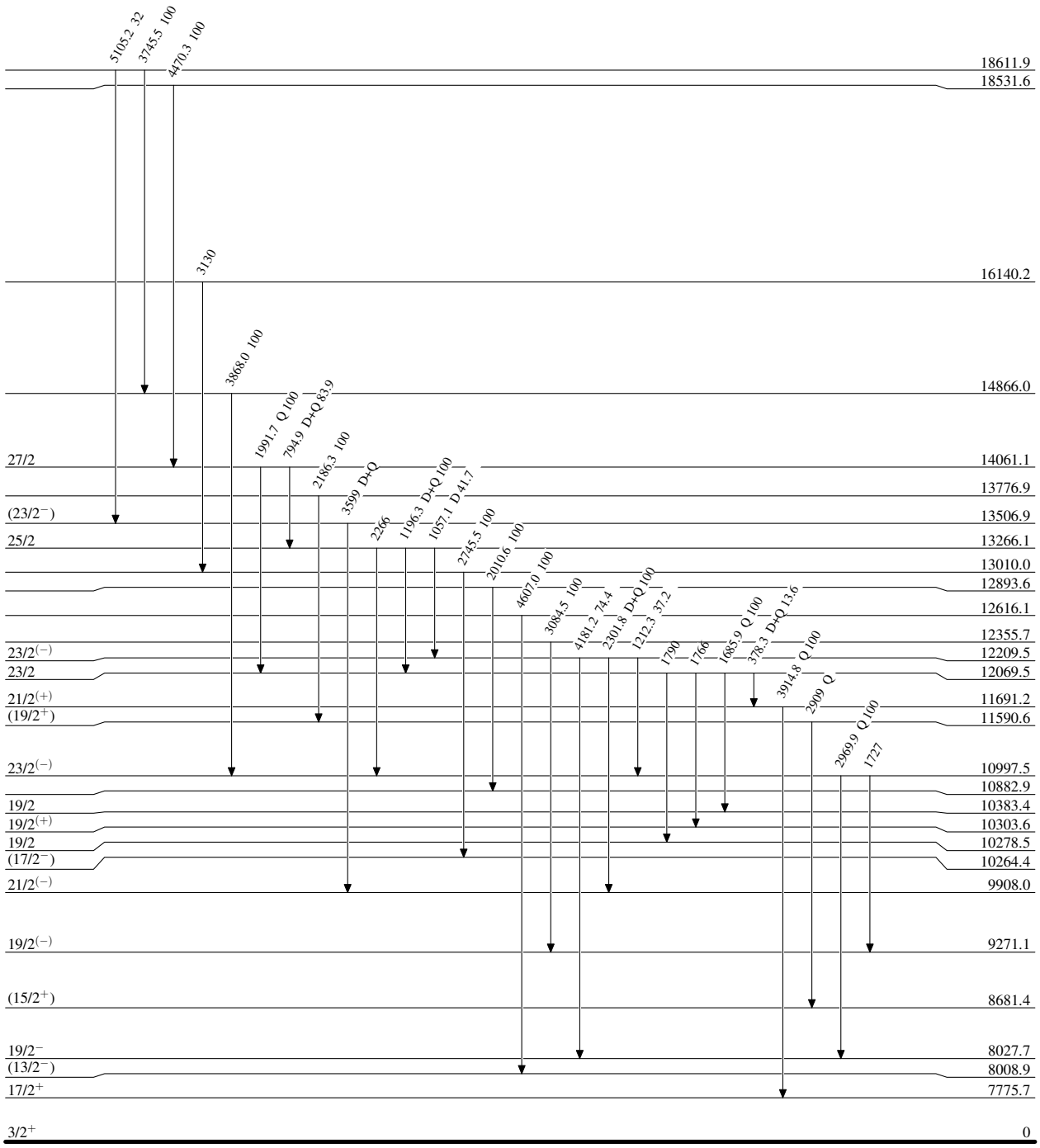
[@] From $\gamma(\theta)$ in 1978Eg02.

[&] From 1999AnZT only, but not reported in 1999An39.

$^{16}O(^{28}Si,\alpha p\gamma),^{28}Si(^{16}O,\alpha p\gamma)$ 1999AnZT,1978Eg02,1975Uh01

Level Scheme

Intensities: Relative photon branching from each level

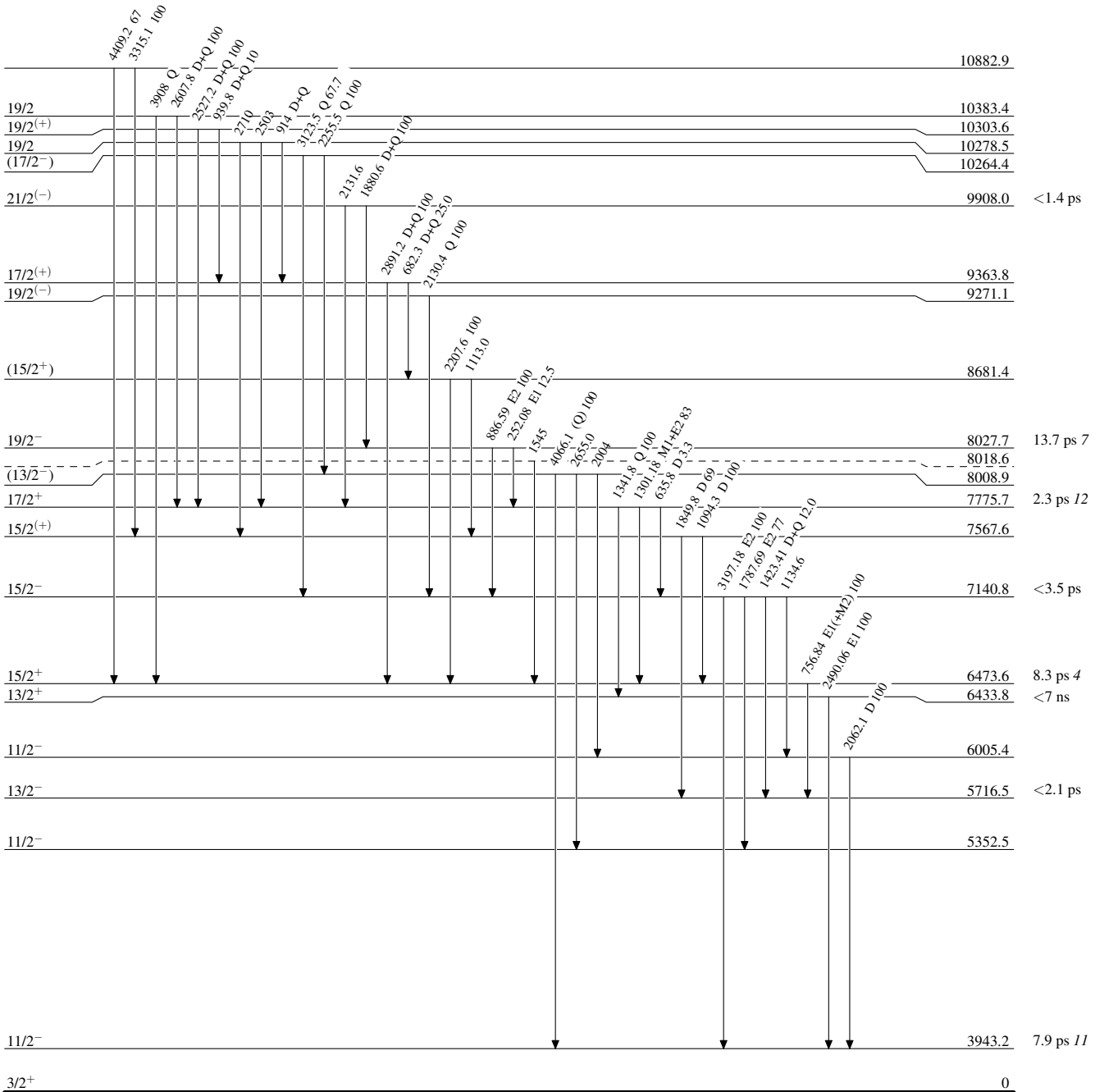


$^{39}_{19}K_{20}$

$^{16}O(^{28}Si,\alpha p\gamma),^{28}Si(^{16}O,\alpha p\gamma)$ 1999AnZT,1978Eg02,1975Uh01

Level Scheme (continued)

Intensities: Relative photon branching from each level

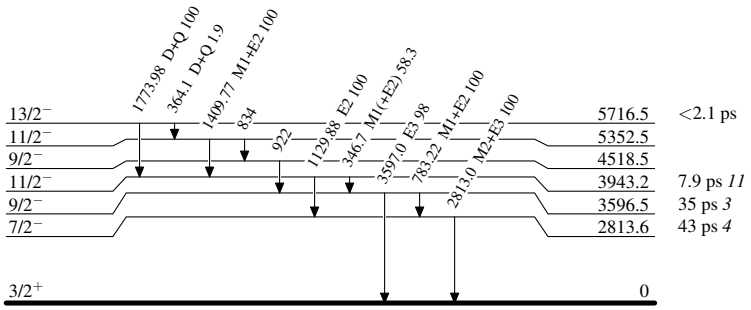


$^{39}_{19}K_{20}$

^{16}O(^{28}Si,αpγ),^{28}Si(^{16}O,αpγ) 1999AnZT,1978Eg02,1975Uh01

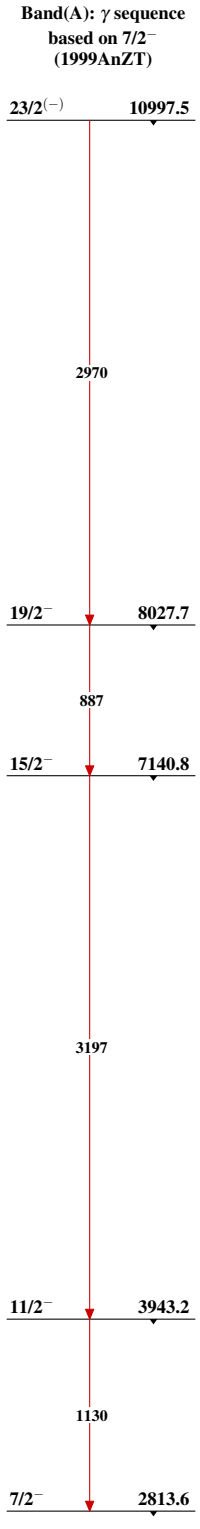
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{39}_{19}K_{20}$

$^{16}O(^{28}Si,\alpha p\gamma),^{28}Si(^{16}O,\alpha p\gamma)$ 1999AnZT,1978Eg02,1975Uh01



$^{39}_{19}K_{20}$