^{16}O(^{48}Ca,p2nγ) 1996Re18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Kazimierz Zuber, Balraj Singh	NDS 125, 1 (2015)	25-Jan-2015

1996Re18: ^{61}Co produced in ^{16}O(^{48}Ca,p2n) reaction at a beam energy of 110 MeV. Measured Eγ, Iγ, γ(θ), pγ, npγ and pγγ coin, lifetimes by the Doppler shift attenuation method (DSAM).

^{61}Co Levels

E(level)[†]	Jπ[‡]	$T_{1/2}$[#]	Comments
0.0	7/2⁻		
1028.0 *5*	(3/2)		
1284.5[a] *5*	9/2⁻	0.55 ps *14*	
1326.0 *9*	(1/2)		Jπ: 1/2 consistent with isotropic γ(θ).
1663.8[@] *6*	11/2⁻	7 ps *+7−2*	
2338.1[a] *8*	(11/2⁻)	1.7 ps *+4−3*	
2373.8[@] *7*	(13/2)⁻		
3126.2[@] *7*	(15/2⁻)		
3471.0[a] *8*	(13/2⁻)		
3657.4[&] *8*	(15/2)⁻		
4093.1[&] *9*	(17/2⁻)	0.76 ps *21*	
4801.6[&] *18*	(19/2⁻)		

[†] From a least-squares fit to Eγ data.
[‡] From 1996Re18 based on γ(θ) data and decay pattern, assuming yrast type of level population. See also Adopted Levels for confirming or different assignments in some cases.
[#] From Doppler shift attenuation method (DSAM). Because of the incomplete nature of the decay scheme, the side feeding into the gamma transitions used for $T_{1/2}$ determination is not well known. Hence, the intrinsic lifetimes of the states could not be accurately deduced, and only apparent lifetimes, and should be treated as lower limits.
[@] Band(A): γ cascade based on 11/2⁻.
[&] Band(B): γ cascade based on (15/2⁻).
[a] Band(C): γ cascade based on 9/2⁻.

γ(^{61}Co)

Angular distributions for two angles Iγ(135°)/Iγ(90°), measuring the anisotropy using the 90° and 135° detectors , negative value of A_2 is for dipole transition and positive value for quadrupole or a J to J dipole transition. Mixed dipole/quadrupole transitions can have either positive or negative value of A_2.

Eγ	Iγ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	Comments
186.4 *5*	29 *4*	3657.4	(15/2)⁻	3471.0	(13/2⁻)	(D)	A_2=−0.10 *13* Iγ(135°)/Iγ(90°)=0.93 *9*.
298.0 *7*	1 *1*	1326.0	(1/2)	1028.0	(3/2)		A_2=+0.17 *38* Iγ(135°)/Iγ(90°)=1.1 *4*.
379.1 *5*	25 *4*	1663.8	11/2⁻	1284.5	9/2⁻		A_2=−0.04 *15* Iγ(135°)/Iγ(90°)=0.97 *12*.
435.7 *5*	28 *5*	4093.1	(17/2⁻)	3657.4	(15/2)⁻	(D)	A_2=−0.13 *15* Iγ(135°)/Iγ(90°)=0.91 *11*.
531.2 *5*	12 *3*	3657.4	(15/2)⁻	3126.2	(15/2⁻)	(D)	A_2=+0.45 *29* Iγ(135°)/Iγ(90°)=1.4 *3*. γ(θ) consistent with ΔJ=0, dipole transition.

Continued on next page (footnotes at end of table)

$^{16}O(^{48}Ca,p2n\gamma)$ 1996Re18 (continued)

$\gamma(^{61}Co)$ (continued)

E_γ	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	Comments
708.5 *15*	28 *6*	4801.6	(19/2⁻)	4093.1	(17/2⁻)	(D)	A_2=−0.16 *12* for the unresolved doublet: 708.5 and 710.0 keV. Iγ(135°)/Iγ(90°)=0.89 *8*.
710.0 *5*	42.7 *6*	2373.8	(13/2)⁻	1663.8	11/2⁻	(D)	I_γ: deduced from p-γ-γ coin data. A_2=−0.16 *12* for the unresolved doublet: 708.5 and 710.0 keV. Iγ(135°)/Iγ(90°)=0.89 *8*.
752.4 *5*	18.2 *40*	3126.2	(15/2⁻)	2373.8	(13/2)⁻	D	A_2=−0.24 *21* Iγ(135°)/Iγ(90°)=0.84 *14*. ΔJ=1 transition.
1028.0 *5*	6.4 *9*	1028.0	(3/2)	0.0	7/2⁻		A_2=−0.13 *27* Iγ(135°)/Iγ(90°)=0.91 *20*.
1053.9 *7*	24.5 *6*	2338.1	(11/2⁻)	1284.5	9/2⁻	D	A_2=−0.27 *19* Iγ(135°)/Iγ(90°)=0.82 *14*. γ(θ) consistent with a ΔJ=1 transition.
1133.3 *7*	7.3 *3*	3471.0	(13/2⁻)	2338.1	(11/2⁻)	(D)	A_2=+0.06 *29* Iγ(135°)/Iγ(90°)=1.1 *3*.
1284.5 *6*	92.7 *8*	1284.5	9/2⁻	0.0	7/2⁻		
1462.4 *8*	4.5 *2*	3126.2	(15/2⁻)	1663.8	11/2⁻	Q	A_2=+0.5 *5* Iγ(135°)/Iγ(90°)=1.5 *5*.
1663.8 *7*	100 *14*	1663.8	11/2⁻	0.0	7/2⁻	(E2)	A_2=+0.38 *13* Iγ(135°)/Iγ(90°)=1.35 *17*.
1806.5 *10*	29 *4*	3471.0	(13/2⁻)	1663.8	11/2⁻	(D)	A_2=−0.13 *14* Iγ(135°)/Iγ(90°)=0.91 *10*.

† Relative intensities from p-γ data, normalized to Iγ(1663.8γ)=100, unless indicated otherwise.
‡ From γ(θ) and ΔJ$^\pi$.

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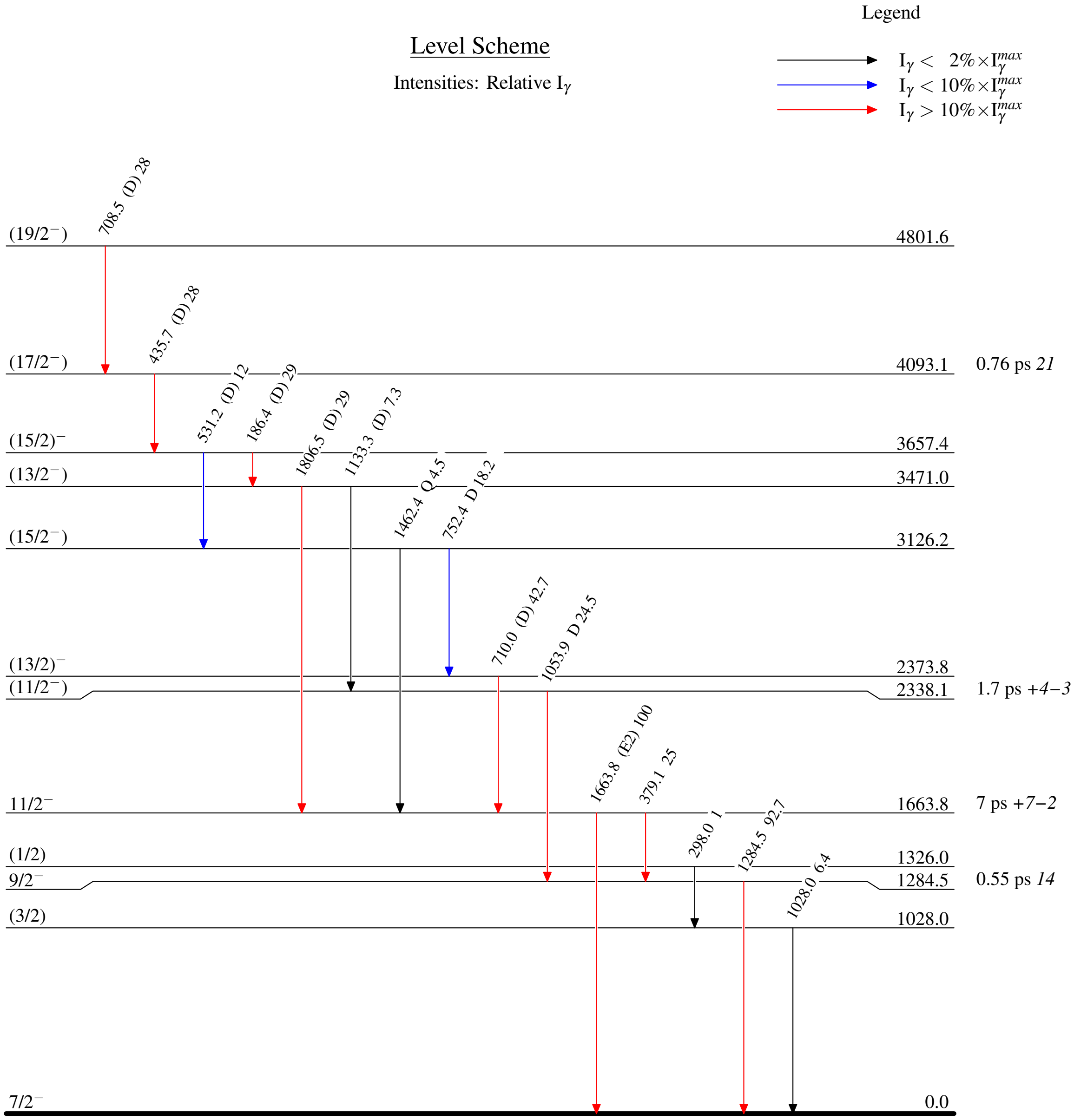
Level Scheme

Intensities: Relative I_γ



$^{61}_{27}Co_{34}$

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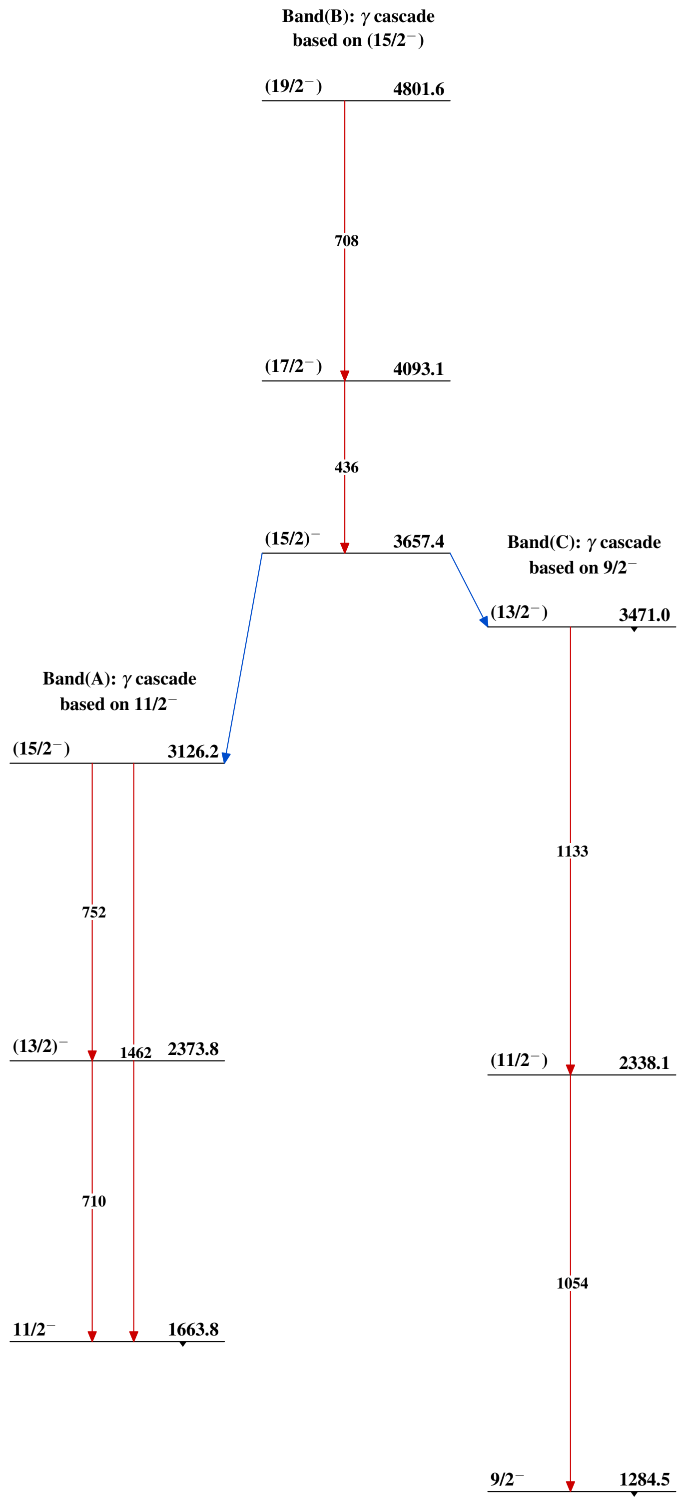

$^{61}_{27}Co_{34}$