^{18}O(^{18}O,pnγ) E=34 MeV 2009Ch43

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, Balraj Singh	NDS 113, 1563 (2012)	28-May-2012

2009Ch43: E=34 MeV. Experiments done at BARC-TIFR facility. Detector system was an array of seven Compton-suppressed Clover Ge detectors placed at 30°, 60°, 90°, 120° and 150° relative to the beam direction. Measured Eγ, Iγ, $\gamma\gamma$, $\gamma\gamma(\theta)$(DCO), $\gamma\gamma(\theta$,lin pol). Comparisons with truncated (1p-1h) shell-model calculations in the *sdpf* orbital space.
Other: 2010Gh02 (same experiment and data As 2009Ch43).

^{34}P Levels

E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡	E(level)†	J$^\pi$‡
0.0	1^+	2305.6 *15*	$4^{(-)}$	3749.3 *18*		4630.8 *16*	$6^{(-)}$
429.4 *10*	2^+	2321.1 *15*	(3^-)	3943.3 *18*		6237.7 *16*	$7^{(+)}$
1609.2 *15*	(1^+)	3353.3 *17*	$5^{(-)}$	3951.6 *17*	$5^{(-)}$		

† From least-squares fit to the Eγ data.
‡ From $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(lin pol) data of 2009Ch43.

γ(^{34}P)

DCO ratio corresponds to angles of 90° and 30° (or 150°). Expected ratios are ≈1 for ΔJ=2, quadrupole and ≈0.5 for ΔJ=1, dipole, when gated by ΔJ=2, quadrupole transition. Ratios are ≈2 for ΔJ=2, quadrupole and ≈1 for ΔJ=1, dipole, when gated on ΔJ=1, dipole transition.
DCO and POL values are from e-mail reply received from the first author of 2009Ch43 on Sept 14, 2009.

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.†	δ	Comments
429.4 *10*	100 *3*	429.4	2^+	0.0	1^+	D+Q		DCO=0.57 *10* gated on 1876γ. Mult.: M1+E2 (2009Ch43).
679.4 *10*	3.17 *16*	4630.8	$6^{(-)}$	3951.6	$5^{(-)}$	(M1)‡		DCO=0.46 *8* gated on 1876γ.
1047.8 *10*	17.1 *9*	3353.3	$5^{(-)}$	2305.6	$4^{(-)}$	D		Mult.: (M1) (2009Ch43). DCO=0.28 *5* gated on 1876γ.
1179.8 *10*	0.74 *10*	1609.2	(1^+)	429.4	2^+	D		Mult.: (M1) (2009Ch43). DCO=0.77 *14* gated on 429γ.
1443.7# *10*		3749.3		2305.6	$4^{(-)}$			
1607.1 *10*	4.5 *5*	6237.7	$7^{(+)}$	4630.8	$6^{(-)}$	D		DCO=0.43 *8* gated on 1876γ. Mult.: (E1) (2009Ch43).
1637.7# *10*		3943.3		2305.6	$4^{(-)}$			
1646.2 *10*	3.6 *4*	3951.6	$5^{(-)}$	2305.6	$4^{(-)}$	(M1)‡		DCO=0.88 *15* gated on 1607γ.
1876.1 *10*	88.6 *11*	2305.6	$4^{(-)}$	429.4	2^+	(M2+E3)	−0.65 *38*	DCO=1.6 *3* gated on 429γ. Mult.: highly mixed transition suggested by DCO=1.62 *26*, POL ≈ 0 for gate on 429.4γ (2^+ to 1^+, M1+E2 transition). δ: −0.27 to −1.03 from analysis of DCO and POL data with σ/J=0.4. Other possible δ=+1.2 to +4.0 is unrealistic from RUL. Shell-model calculations predicting δ=−0.034 is in disagreement.
1891.6 *10*	11.3 *9*	2321.1	(3^-)	429.4	2^+	D+Q		DCO=1.07 *18* gated on 429γ. Mult.: (E1+M2) (2009Ch43).
2325.1 *10*	4.2 *3*	4630.8	$6^{(-)}$	2305.6	$4^{(-)}$	(E2)‡		DCO=1.8 *3* gated on 1607γ.

Continued on next page (footnotes at end of table)

^{18}O(^{18}O,pnγ) E=34 MeV 2009Ch43 (continued)

γ(^{34}P) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
2884.3 *10*	6.6 *4*	6237.7	$7^{(+)}$	3353.3	$5^{(-)}$	Q	DCO=1.35 *22* gated on 1876γ. Mult.: (M2) (2009Ch43).
3931.7[#] *10*		6237.7	$7^{(+)}$	2305.6	$4^{(-)}$	[E3]	

[†] As proposed by 2009Ch43 based on $\gamma\gamma(\theta)$(DCO) and $\gamma\gamma$(lin pol) data, but polarization coefficients were not available from the authors.
[‡] Multipolarity consistent with qualitative $\gamma\gamma$(lin pol) results.
[#] Weak γ ray.

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Level Scheme

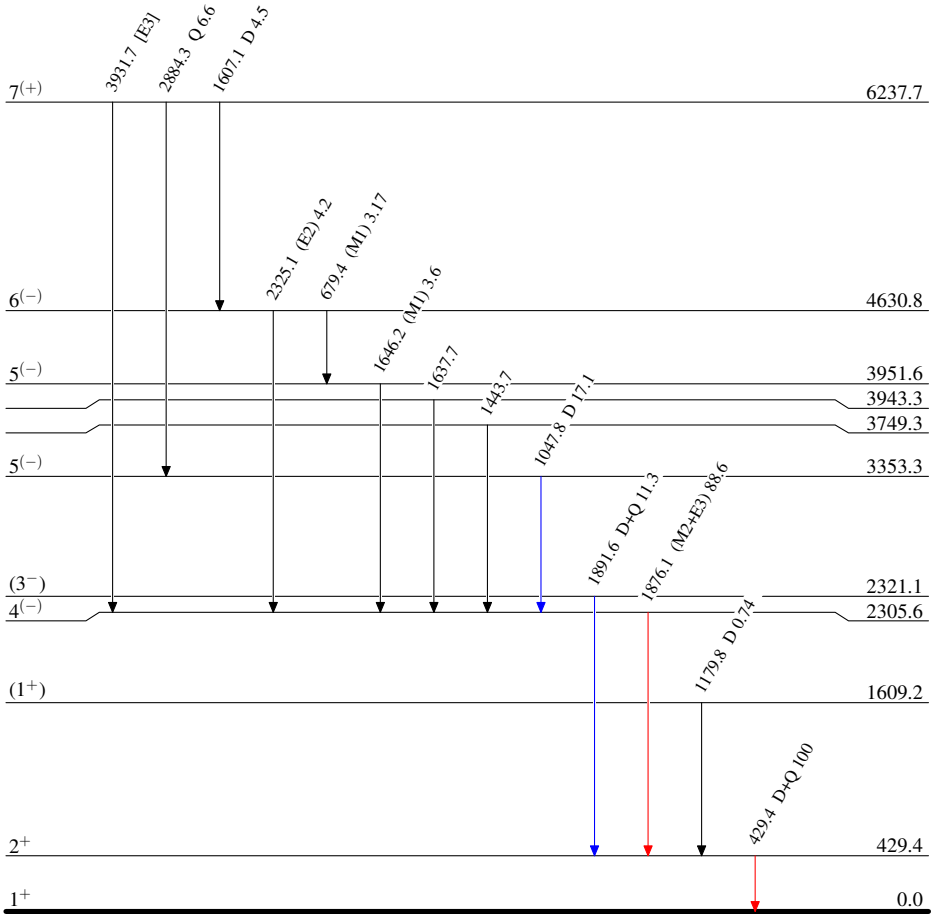
Intensities: Relative I_γ

Legend

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

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

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



$^{34}_{15}P_{19}$