^{174}Yb(γ,γ') 1990Zi01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, Huo Junde	NDS 87, 15 (1999)	1-Nov-1998

Additional information 1.

Enriched targets of ^{174}Yb were irradiated with 4.1-MeV endpoint bremsstrahlung radiation. Measured Eγ, Iγ at θ=90° and 127°. Detectors: Ge(Li). Deduced $\Gamma^2_{\gamma0}/\Gamma$, branching ratios $\Gamma_\gamma/\Gamma_{\gamma0}$. Others: 1973Le16, measured x-ray fluorescence, isotope shifts. See 1978Gu26 and 1981Gu02 for giant dipole resonances.

See 1991Zi01 for a systematic study of dipole transitions from low-lying J=1 states. The assignment of the 1711-keV level (J$^\pi$=1$^-$) to an octupole band is based on this work.

^{174}Yb Levels

E(level)	J$^\pi$†	T$_{1/2}$@	$\Gamma^2_{\gamma0}/\Gamma$(eV)	Comments
0.0	0$^+$			
77	2$^+$			
1711‡	(1$^-$)	7.6 fs *20*	0.011 *3*	
2037#	1		0.003 *3*	
2068#	1		0.004 *3*	
2338#	1		0.008 *3*	
2500#	1		0.013 *6*	
2581#	1		0.009 *5*	
2815#	1		0.007 *5*	
2920#	1		0.030 *9*	
3009‡	(1$^-$)	3.9 fs *13*	0.010 *3*	
3050‡	(1$^-$)	15 fs *10*	0.007 *5*	
3122#	1		0.008 *7*	
3145#	1		0.009 *5*	
3222‡	(1$^-$)	3.9 fs *19*	0.014 *7*	
3327‡	(1$^-$)	2.8 fs *7*	0.036 *9*	
3349#	1$^+$		0.030 *16*	J$^\pi$: parity from ^{174}Yb(e,e$'$) (1984Bo43).
3387‡	(1$^-$)	1.8 fs *5*	0.026 *8*	
3485#	1		0.023 *9*	
3527‡	(1$^-$)	1.6 fs *5*	0.038 *11*	
3562#	1$^+$		0.048 *14*	J$^\pi$: parity from ^{174}Yb(e,e$'$) (1984Bo43).
3647‡	(1$^-$)	7.8 fs *7*	0.012 *11*	
3695#	1		0.044 *22*	

† Because of the low momentum transfer, photon scattering nearly exclusively excites states with J=1 or 2 in ^{174}Yb. K-quantum numbers were determined from Alaga rule. Levels with K=0 have odd parity, on the basis of model-dependent arguments.

‡ K$^\pi$=(0$^-$).

K=1.

@ Deduced by evaluator from $\Gamma_{\gamma0}$ and branching $\Gamma_{\gamma0}/\Gamma_\gamma$, assuming that only the transitions to the first J$^\pi$=2$^+$ state significantly contribute the level ΔE-excitation.

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γ(^{174}Yb)

E_γ †	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡
1634	135 *18*	1711	(1$^-$)	77	2$^+$	
1711	100	1711	(1$^-$)	0.0	0$^+$	D
1960	64 *40*	2037	1	77	2$^+$	
1991	67 *34*	2068	1	77	2$^+$	
2037	100	2037	1	0.0	0$^+$	D
2068	100	2068	1	0.0	0$^+$	D
2261	74 *20*	2338	1	77	2$^+$	
2338	100	2338	1	0.0	0$^+$	D
2423	60 *16*	2500	1	77	2$^+$	
2500	100	2500	1	0.0	0$^+$	D
2504	46 *14*	2581	1	77	2$^+$	
2581	100	2581	1	0.0	0$^+$	D
2738	90 *38*	2815	1	77	2$^+$	
2815	100	2815	1	0.0	0$^+$	D
2843	41 *7*	2920	1	77	2$^+$	
2920	100	2920	1	0.0	0$^+$	D
2932	254 *48*	3009	(1$^-$)	77	2$^+$	
2973	106 *42*	3050	(1$^-$)	77	2$^+$	
3009	100	3009	(1$^-$)	0.0	0$^+$	D
3045	50 *27*	3122	1	77	2$^+$	
3050	100	3050	(1$^-$)	0.0	0$^+$	D
3068	76 *29*	3145	1	77	2$^+$	
3122	100	3122	1	0.0	0$^+$	D
3145	100	3145	1	0.0	0$^+$	D
3145	186 *53*	3222	(1$^-$)	77	2$^+$	
3222	100	3222	(1$^-$)	0.0	0$^+$	D
3250	114 *14*	3327	(1$^-$)	77	2$^+$	
3272	58 *18*	3349	1$^+$	77	2$^+$	
3310	211 *31*	3387	(1$^-$)	77	2$^+$	
3327	100	3327	(1$^-$)	0.0	0$^+$	D
3349	100	3349	1$^+$	0.0	0$^+$	D
3387	100	3387	(1$^-$)	0.0	0$^+$	D
3409	68 *18*	3485	1	77	2$^+$	
3451	175 *26*	3527	(1$^-$)	77	2$^+$	
3485	100	3485	1	0.0	0$^+$	D
3485	47 *8*	3562	1$^+$	77	2$^+$	
3527	100	3527	(1$^-$)	0.0	0$^+$	D
3562	100	3562	1$^+$	0.0	0$^+$	D
3571	120 *69*	3647	(1$^-$)	77	2$^+$	
3619	48 *16*	3695	1	77	2$^+$	
3647	100	3647	(1$^-$)	0.0	0$^+$	D
3695	100	3695	1	0.0	0$^+$	D

† Nominal values.
‡ From $\gamma(\theta)$: W(90°) / W (127°)≈2 for quadrupole radiation;≈0.7, for dipole radiation.

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Level Scheme

Intensities: Type not specified