Coulomb excitation 2014Br05

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 130, 21 (2015)	15-Jul-2015

2014Br05: Beam=^{182}Hg at 2.85 MeV/nucleon from REX-ISOLDE-CERN facility. Targets=2.3 mg/cm^2 thick ^{120}Sn, 1.1 mg/cm^2 thick ^{107}Ag, and 2 mg/cm^2 thick ^{112,114}Cd. Measured Eγ, Iγ, $\gamma\gamma$-coin, (projectile particle)γ-coin, (target particle)γ-coin, K x-ray intensities using MINIBALL array for γ rays and double-sided silicon strip detectors (DSSSDs) for particle detection. Deduced γ-ray yields, E2 matrix elements, quadrupole invariants <Q^2> and <cos(3δ)> by GOSIA analysis. Comparison with calculations using beyond mean field and interacting-boson based models. Results interpreted within a two-state mixing model.

In GOSIA analysis, known spectroscopic data for branching ratios, level lifetimes, and conversion coefficients were used. Some of results may have been taken from β-decay studies of ^{182}Tl by E. Rapisarda et al. (to be published; reference 15 in 2014Br05).

^{182}Hg Levels

A third 2$^+$ level is also mentioned in Author e-mail reply of May 16, 2014; only branching ratio data are supplied, not the level energy.

E(level)	J$^\pi$	T$_{1/2}$	Comments
0	0$^+$		Based on deduced quadrupole invariants <Q^2> and <cos(3δ)>, ground state is weakly deformed with $\beta\approx$0.15; consistent with oblate-like deformation.
335	0$^+$		Based on deduced quadrupole invariants <Q^2> and <cos(3δ)>, first excited state is prolate deformed.
352	2$^+$	29.7 ps *+13−18*	T$_{1/2}$: deduced by evaluator from E2 matrix element from g.s., assuming 100% branch for 352γ. E2 matrix element (0,0$^+$ to 352,2$^+$)=+1.29 *+4−3* (2014Br05). B(E2)(from 0,0$^+$)=1.66 *+11−7*. E2 matrix element (335,0$^+$ to 352,2$^+$)=−2.68 *+15−13* (2014Br05). B(E2)(from 335,0$^+$)=7.2 *+7−8*. Diagonal E2 matrix element (352,2$^+$ to 352,2$^+$)=−0.04 *+130−140* (2014Br05).
548	2$^+$	9.5 ps *+27−22*	T$_{1/2}$: deduced by evaluator from B(E2)=0.37 *+4−3* from g.s. and branching ratios supplied by authors in May 16, 2014 e-mail reply. Using B(E2)=2.9 *7* for 335,0$^+$ to 548,2$^+$ level gives T$_{1/2}$=9.0 ps *+60−37*, consistent with that obtained from B(E2) value for g.s. to 548 level. E2 matrix element (0,0$^+$ to 548,2$^+$)=−0.61 *3* (2014Br05). B(E2)(from 0,0$^+$)=0.37 *+4−3*. E2 matrix element (335,0$^+$ to 548,2$^+$)=−1.7 *2* (2014Br05). B(E2)(from 335,0$^+$)=2.9 *7*. E2 matrix element (352,2$^+$ to 548,2$^+$)=−2.2 *4* (2014Br05). B(E2)(from 352,2$^+$)=0.97 *+38−32*. Diagonal E2 matrix element (548,2$^+$ to 548,2$^+$)=+0.8 *+10−6* (2014Br05).
613	4$^+$	26.1 ps *+9−8*	T$_{1/2}$: deduced by evaluator from E2 matrix element from 352,2$^+$, assuming 100% branch for 261γ. E2 matrix element (352,2$^+$ to 613,4$^+$)=+3.71 *6* (2014Br05). B(E2)(from 352,2$^+$)=2.75 *9*. E2 matrix element (548,2$^+$ to 613,4$^+$)=+3.1 *3* (2014Br05). B(E2)(from 548,2$^+$)=1.9 *+4−3*.
946	6$^+$		
1125	4$^+$		

γ(^{182}Hg)

E$_i$(level)	J$_i^\pi$	E$_\gamma$	I$_\gamma$	E$_f$	J$_f^\pi$	Mult.	$\alpha^\ddagger$	Comments
335	0$^+$	335		0	0$^+$			
352	2$^+$	352		0	0$^+$	E2	0.0673	α: for Eγ=351.7 *3*.
548	2$^+$	196	8.8† *32*	352	2$^+$	E0+M1+E2	4.7 *13*	α(exp)=4.7 *13* (2014Br05) α(exp): quoted by 2014Br05 (in reference 15) from ^{182}Tl

Continued on next page (footnotes at end of table)

Coulomb excitation 2014Br05 (continued)

$\gamma(^{182}Hg)$ (continued)

E_i(level)	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α‡	Comments
								decay results yet to be published. E_γ: γ ray reported on the basis of ^{182}Tl decay results yet to be published (reference 15 in 2014Br05).
548	2^+	213	6.5† *23*	335	0^+	[E2]	0.315	
		548	100†	0	0^+	[E2]	0.0217	
613	4^+	261		352	2^+	E2	0.1619	α: for Eγ=261.5 *3*.

† From γ-branching ratio data received in e-mail reply of May 16, 2014 from K. Wrzosek Lipska. These values are from reference 15 (to be published) in 2014Br05. Also branching ratio from a third 2^+ state is given as: Iγ(third 2^+ to 352,2^+)/Iγ(third 2^+ to 335,0^+)=0.70 *22*. Energy of the third 2^+ level and associated γ-ray energies are not stated.

‡ Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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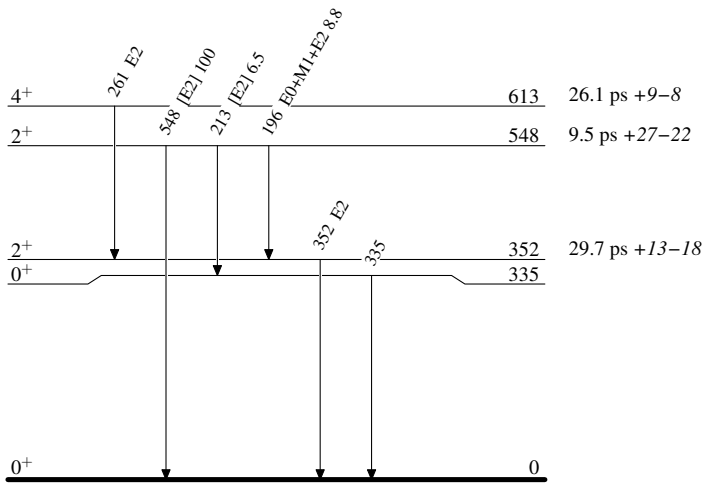
Level Scheme

Intensities: Relative photon branching from each level



$^{182}_{80}Hg_{102}$