Coulomb excitation 1989Bu07

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 146, 1 (2017)	30-Sep-2017

1989Bu07: (α,α') and (^{16}O,^{16}O′) E=10.8-11.8 MeV α beam and ^{16}O beam were produced from the ANU 14UD Pelletron accelerator. Targets were isotopically enriched $BaCl_2$ evaporated onto carbon backings. BackScattered particles were detected with an annular silicon-barrier detector. Measured Coulomb excitation probability of first 2^+ state. Deduced B(E2), static electric quadrupole moment.

1985Bu01: (^{12}C,^{12}C′) E=40 MeV ^{12}C beam was produced from the ANU 14UD accelerator incident on $BaCl_2$ target. Scattered ions were momentum-analyzed with an Engel split-pole spectrograph and detected by a position-sensitive, gas-filled proportional counter. Measured Coulomb excitation probabilities of 2^+ and 3^- states. Deduced B(E2), B(E3).

1987Ba65: (^{32}S,^{32}S′) E=105 MeV ^{32}S beam was produced from the XTU Tandem accelerator of the Laboratori Nazionali di Legnaro (LNL). Target was 98% enriched ^{138}Ba of about 230 μg/cm^2 on iron backing. γ rays were detected with NaI and Ge detectors. Measured Eγ, Iγ, particle-γ-coin, $\gamma\gamma$-coin, $\gamma(\theta$,H). Deduced g factor.

1978Ki09: (α,α') E=12.15-12.40 MeV. Measured Coulomb excitation. Deduced B(E2) of the first 2^+ state..

1972Ke16: (^{16}O,^{16}O′) E=47 MeV. Measured $\sigma(\theta)$. Deduced B(E2), quadrupole moment of the first 2^+ state.

1963Al31,1961An07: (^{16}O,^{16}O′).

^{138}Ba Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0.0	0^+		
1436	2^+	0.204 ps *6*	B(E2)↑=0.227 *6* Q=−0.14 *6* g=0.72 *11* (1987Ba65) $T_{1/2}$: deduced from B(E2)↑. B(E2)↑ is weighted average of 0.241 *6* (1989Bu07), 0.232 *7* and 0.240 *7* (1985Bu01), 0.217 *4* (1978Ki09), 0.221 *9* (1972Ke16). Others: 0.38 *11* (1961An07), 0.27 *9* (1963Al31). Q: from 1989Bu07 for constructive interference from the second 2^+ state. 1989Bu07 give +0.08 *6* for destructive interference. Other: Q=−0.07 *15* (1972Ke16).
2218	2^+	135 fs *+21−16*	B(E2)↑=0.038 *5* (1985Bu01) $T_{1/2}$: deduced from B(E2)↑ and adopted γ-ray branching ratios in Adopted Gammas. B(E2)↑ from 1985Bu01. 1985Bu01 also give B(E2)↑($2^+_1 \rightarrow 2^+_2$)=0.028 *5*.
2881	3^-		B(E3)↑=0.133 *13* (1985Bu01)

† From 1985Bu01.
‡ From Adopted Levels.

$\gamma(^{138}$Ba)

E$_\gamma$†	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Comments
(782)	2218	2^+	1436	2^+	
1436	1436	2^+	0.0	0^+	E$_\gamma$: observed in 1987Ba65.
(2218)	2218	2^+	0.0	0^+	

† Rounded values from Adopted Gammas.

Legend

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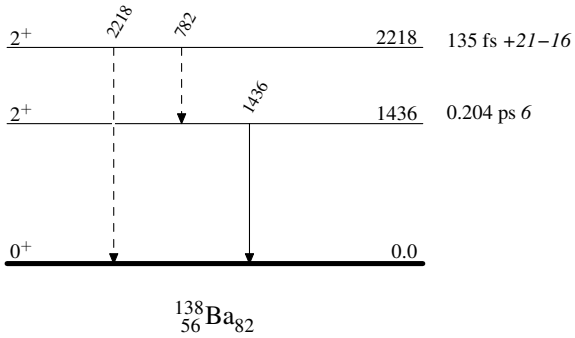
Level Scheme

γ Decay (Uncertain)



$^{138}_{56}Ba_{82}$