

$^{138}\text{Ba}(\text{p},\text{p}')$ 1974La06,1967Mo15

Type	Author	History Citation	Literature Cutoff Date
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1974La06: E=30 MeV proton beam was produced from the Michigan State University sector-focused cyclotron. Target was isotopically enriched compound of $\text{Ba}(\text{NO}_3)_2$ (99.8%) evaporated onto a carbon backing. Scattered particles were momentum-analyzed with an Engel split-pole spectrograph and detected by a solid-state position-sensitive detector (FWHM=30 keV) or nuclear emulsions (FWHM=7-10 keV). Measured $\sigma(E_p, \theta)$. Deduced levels, J, π , deformation lengths, L-transfers from DWBA analysis. Comparisons with shell-model calculations.

1967Mo15: E=9.8-11.2 MeV protons were produced from the Argonne National Laboratory accelerator. Scattered particles were detected with solid-state detectors. Measured $\sigma(E_p, \theta)$. Deduced levels, configurations. Level energies for many levels seen in Fig.2 in this paper are not reported.

Additional information 1.

Others: 1976Da19, 1972La23, 1970Hi05, 1970Se02, 1965Za03, 1965Ch20.

 ^{138}Ba Levels

Levels below 3500 are from 1974La06; higher levels are as seen in Fig.2 in 1967Mo15, with energies taken by evaluator from 1971VoZV for the measurement of (d,p) reaction by the same authors of 1967Mo15.

E(level)	L^b	$\beta' R'(\text{fm})^d$	E(level)	L^b	$\beta' R'(\text{fm})^d$	E(level)
0.0			2929 [†] 2			4165 [‡]
1436 ^a 1	2 ^c	0.43	2990 [†] 2			4240 [‡] #
1898 ^a 1	4 ^c	0.31	3050 ^a 1 (2)			4279 [#]
2090 ^a 1	6 ^c	0.30	3156.0 12 4 0.07			4325 [#]
2201 2	(6)	0.15	3254.0 12			4447 [#] @
2218 1	2	0.23	3339.0 14 2 0.15			4586 [#] @
2308 ^a 1	4	0.21	3368.0 18 2 0.17			4648 [#] @
2415.0 12			3561 [‡]			4709 [#] @
2445.0 12			3645 [‡]			4745 [#] @
2584 1	4	0.08	3857 [‡]			4797 [@] &
2639.0 12	2	0.07	3921 [‡] #			≈5030 [@] &
2779 ^a 1	4	0.12	4027 [#]			
2881.0 12	3	0.73	4080 [‡] #			

[†] Weak level, observed only at 20° (1974La06).

[‡] Seen in proton decay of $f_{7/2}$ IAR (1967Mo15).

[#] Seen in proton decay of $p_{3/2}$ IAR (1967Mo15).

[@] Seen in proton decay of $p_{1/2}$ IAR (1967Mo15).

[&] Estimated from Fig.2 of 1967Mo15.

^a Value used for calibration (1974La06).

^b From 1974La06 based on measured differential cross sections compared those of known 2⁺, 3⁻, 4⁺ and 6⁺ states in ^{138}Ba and ^{144}Sm , unless otherwise noted.

^c L-value assigned from known spin-parity of level (1974La06).

^d Deformation length from 1974La06.