^{138}Ba(α,α') 1972Ba98,1985Bu13

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

1972Ba98: E=49.6 MeV α beam was produced from the Texas A&M cyclotron. Targets were metallic barium evaporated onto carbon foils. Scattered particles were momentum-analyzed with an Engel split-pole spectrograph (FWHM=38 keV) and detected by a surface-barrier detector or a position-sensitive nuclear-triode detector. Measured σ(E,θ). Deduced levels, J, π, L-transfers, deformation lengths from DWBA analysis. Comparisons with available data and shell-model calculations.

1985Bu13: E=20 MeV α beam was produced from the ANU 14UD Pelletron accelerator. Targets were isotopically enriched (99.8%) $BaCl_2$ evaporated onto thin carbon backings. Scattered particles were momentum-analyzed with an Engel split-pole spectrograph. Measured σ(E,θ). Deduced levels, J, π, L-transfers, deformation parameters from analysis using coupled-channel calculations.

^{138}Ba Levels

All data are from 1972Ba98, unless otherwise noted.

E(level)	L[‡]	β_LR[#]	Comments
0.0			
1435[†] *5*	2	0.42	
1898[†] *5*	4	0.30	
2120			
2216[†] *5*	(2)	0.19	E(level): 2190 from 1972Ba98. 1972Ba98 claim that it should be identified with the 2218 level in γ-decay studies and the large energy shift is attributed to their poor energy calibration.
2270	(4)	0.19	E(level): 1972Ba98 claim that this level should be identified with the 2308 level in γ-decay studies and the large energy shift is attributed to their poor energy calibration.
2650			
2879[†] *5*	3	0.58	
3340	(2)	0.18	E(level): peak at 3340 consists of an unresolved multiplet with energy separation<40 keV. At least one of these states appears to have L=2.
3500	(4)	0.31	E(level): peak at 3500 consists of an unresolved multiplet with energy separation<40 keV. At least one of these states appears to have L=4.
4170			

[†] From 1985Bu13.
[‡] From DWBA fit to experimental differential cross-sections (1972Ba98).
[#] Deformation length (in fm) from 1972Ba98.