Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	07-Jan-2022

$Q(\beta^-)=-12580$ *SY*; $S(n)=12810$ *SY*; $S(p)=3000$ *SY*; $Q(\alpha)=2460$ *SY*   2021Wa16

Estimated uncertainties (2021Wa16): 360 for $Q(\beta^-)$, 320 for $S(n)$, 210 for $S(p)$, 200 for $Q(\alpha)$.

$Q(\varepsilon)=6210$ *200*, $Q(\varepsilon p)=4700$ *200*, $S(2n)=23960$ *280*, 3730 *200* (syst, 2021Wa16).

1997Ja12 (also 1995Gu01): ^{118}Ba nuclide produced and identified in ^{63}Cu(^{58}Ni,p2n) reaction at 4.3-4.9 MeV/nucleon. On-line mass separation at GSI facility. Measured β^+-delayed x rays and γ rays.

2012WiZY, 2011Ad10: ^{40}Ca(^{78}Kr,X)^{118}Ba*,E=5.5 MeV/nucleon. Measured fragments with Z=3-28 in singles and in coincidence with light charged particles emitted by binary decays of ^{118}Ba compound nucleus using the 4π-INDRA array at GANIL. Deduced center-of-mass kinetic energy distribution of fragments, total kinetic energies (TKEs), and inclusive cross-section distributions of fragments with charge Z=3-28. Comparison with predictions of statistical model.

Theoretical calculations: 56 primary references (34 for structure and 22 for decay modes and half-lives) in the NSR database available at www.nndc.bnl.gov/nsr/.

^{118}Ba Levels

Cross Reference (XREF) Flags

     A ^{58}Ni(^{64}Zn,2p2nγ)

E(level)	$J^{\pi\dagger}$	$T_{1/2}$	XREF	Comments
0	0^+	5.5 s *2*	A	$\%\varepsilon+\%\beta^+=100$; $\%\varepsilon p=?$ $T_{1/2}$: from decay curve for β^+-gated x-rays followed over 12 s (1997Ja12, also 1995Gu01). Decay curve for β-gated γ rays of 40, 52, 76 and 85 keV gave consistent results (1997Ja12).
194.0‡	(2^+)		A	
554.0‡	(4^+)		A	
1042.8‡	(6^+)		A	
1636.0‡	(8^+)		A	
1658.2$^\#$	(5^-)		A	
2012.4$^\#$	(7^-)		A	
2312.0‡	(10^+)		A	
2488.2$^\#$	(9^-)		A	
3051.0‡	(12^+)		A	
3072.2$^\#$	(11^-)		A	
3756.2$^\#$	(13^-)		A	
3836‡	(14^+)		A	
4531$^\#$	(15^-)		A	
4660‡	(16^+)		A	
5376$^\#$	(17^-)		A	
5532‡	(18^+)		A	
6446‡	(20^+)		A	

† As proposed by 1998Sm01, based on band assignments and systematics of even-even nuclei. Strong arguments are lacking since no details of angular distributions/correlations measurements are available.
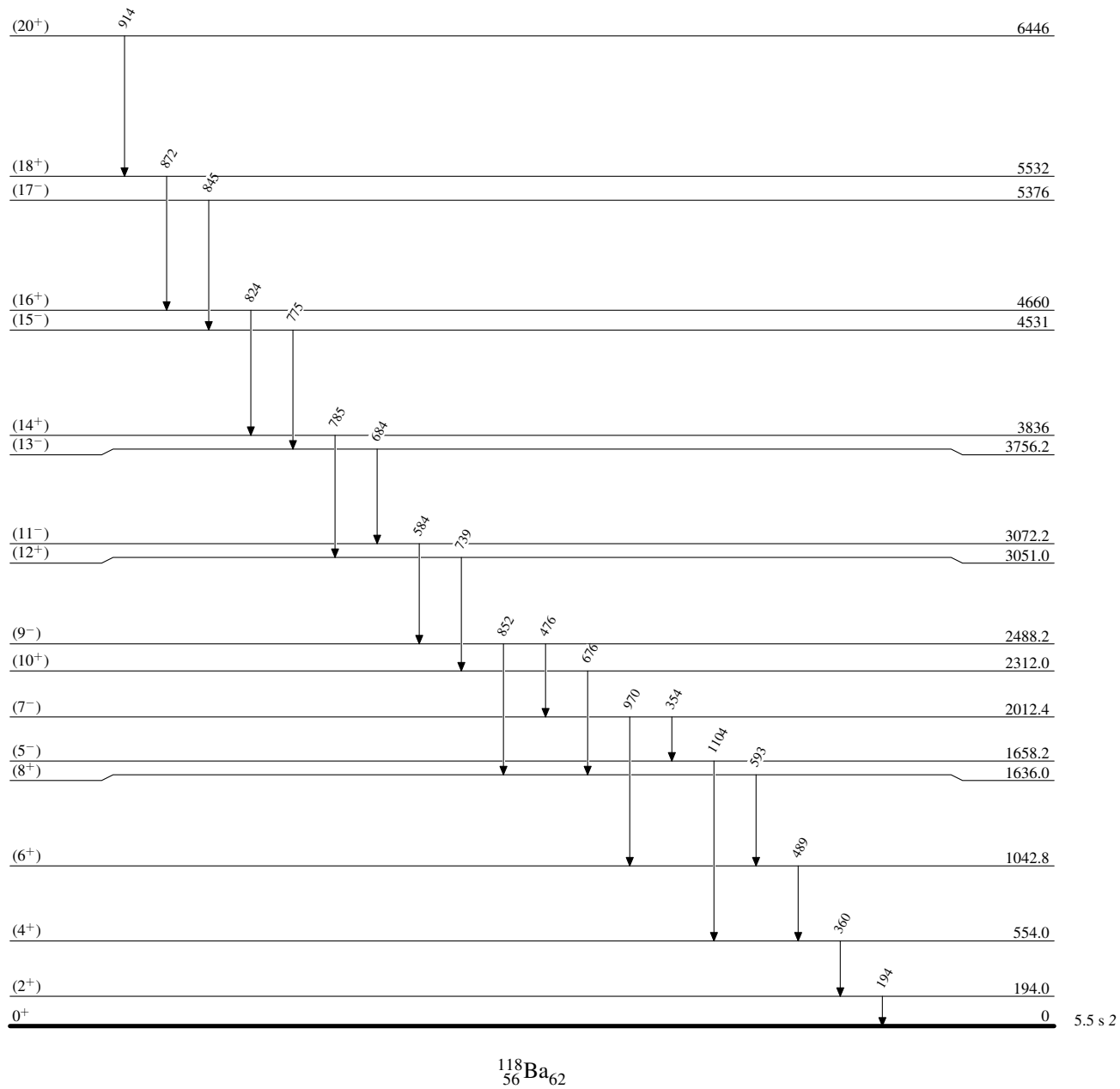
Adopted Levels, Gammas (continued)

^{118}Ba Levels (continued)

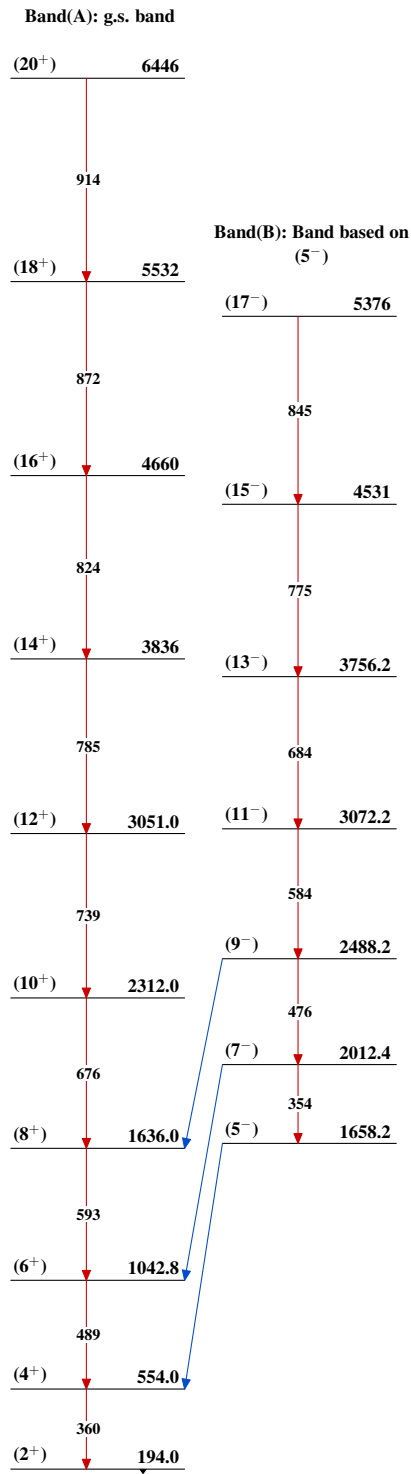‡ Band(A): g.s. band. Evidence of alignment at $\hbar\omega$=0.41 MeV due to $\pi h^2_{11/2}$.

Band(B): Band based on (5$^-$). This band cannot be explained as a pure 2-quasiparticle rotational structure, there is possibility of octupole correlations indicated by strong inter-band transition (1998Sm01).

$\gamma(^{118}Ba)$

E_i(level)	J^π_i	E_γ	E_f	J^π_f	E_i(level)	J^π_i	E_γ	E_f	J^π_f
194.0	(2$^+$)	194	0	0$^+$	3051.0	(12$^+$)	739	2312.0	(10$^+$)
554.0	(4$^+$)	360	194.0	(2$^+$)	3072.2	(11$^-$)	584	2488.2	(9$^-$)
1042.8	(6$^+$)	489	554.0	(4$^+$)	3756.2	(13$^-$)	684	3072.2	(11$^-$)
1636.0	(8$^+$)	593	1042.8	(6$^+$)	3836	(14$^+$)	785	3051.0	(12$^+$)
1658.2	(5$^-$)	1104	554.0	(4$^+$)	4531	(15$^-$)	775	3756.2	(13$^-$)
2012.4	(7$^-$)	354	1658.2	(5$^-$)	4660	(16$^+$)	824	3836	(14$^+$)
		970	1042.8	(6$^+$)	5376	(17$^-$)	845	4531	(15$^-$)
2312.0	(10$^+$)	676	1636.0	(8$^+$)	5532	(18$^+$)	872	4660	(16$^+$)
2488.2	(9$^-$)	476	2012.4	(7$^-$)	6446	(20$^+$)	914	5532	(18$^+$)
		852	1636.0	(8$^+$)					

Adopted Levels, Gammas

Level Scheme

$^{118}_{56}$Ba$_{62}$

Adopted Levels, Gammas

Band(A): g.s. band

Band(B): Band based on (5⁻)

(20^+) 6446

914

(18^+) 5532

(17^-) 5376

872

845

(16^+) 4660

(15^-) 4531

824

775

(14^+) 3836

(13^-) 3756.2

785

684

(12^+) 3051.0

(11^-) 3072.2

739

584

(9^-) 2488.2

(10^+) 2312.0

476

676

(7^-) 2012.4

(8^+) 1636.0

(5^-) 1658.2

354

593

(6^+) 1042.8

489

(4^+) 554.0

360

(2^+) 194.0

$^{118}_{56}Ba_{62}$