

$^{120}\text{Sn}(^{224}\text{Rn}, ^{224}\text{Rn}'\gamma)$ **2020Bu20,2019Bu29**

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh, Sukhjeet Singh	ENSDF	08-Mar-2022

2020Bu20, 2019Bu29: $E(^{224}\text{Rn})=5.08$ MeV/nucleon produced in bombardment of thorium carbide with 1.4-GeV protons from CERN PS Booster, followed by separation of ions of interest according to A/Q , and delivered to a Penning trap, REXTRAP, where the singly-charged ions were accumulated and cooled before being allowed to into an electron beam ion source, REXEBIS. The ions were then confined in a high-density electron beam that stripped more electrons to produce a charge state of 52^+ for ^{224}Rn beam, extracted as 1 ms pulses before being mass-selected again according to A/q , and injected into the HIE-ISOLDE linear post-accelerator. ^{120}Sn target was about 2 mg/cm² thick. Measured $E\gamma$, $I\gamma$, $\gamma\gamma$ -coin using Miniball array of 24 HPGe detectors. Scattered particles and target recoils were detected in a highly segmented silicon detector. Deduced levels, J^π , g.s. band and an octupole band. Authors conclude that while octupole vibrations exist, but with no static pear-shapes (or static octupole deformation) in the ground state.

 ^{224}Rn Levels

$E(\text{level})^\dagger$	J^π^\ddagger	$E(\text{level})^\dagger$	J^π^\ddagger	$E(\text{level})^\dagger$	J^π^\ddagger
0.0 [#]	0 ⁺	650.6 [@] 8	(3 ⁻)	1277.2 [@] 10	(9 ⁻)
135.6 [#] 5	2 ⁺	790.8 [@] 8	(5 ⁻)	1327.8 [#] 10	10 ⁺
357.6 [#] 6	4 ⁺	969.2 [#] 9	8 ⁺	1588.3 [@] 13	(11 ⁻)
641.4 [#] 8	6 ⁺	1006.4 [@] 10	(7 ⁻)	1706.8 [#] 11	12 ⁺
				2098.7 [?] # 13	(14 ⁺)

[†] From **2020Bu20**, based on their $E\gamma$ data.

[‡] As proposed by **2020Bu20**, based on population of an even-even nucleus in Coulomb excitation process with E2 excitations, and band structures.

[#] Band(A): g.s. band.

[@] Band(B): Octupole band based on (3⁻).

 $\gamma(^{224}\text{Rn})$

E_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π	E_γ^\dagger	$E_i(\text{level})$	J_i^π	E_f	J_f^π
135.6 5	135.6	2 ⁺	0.0	0 ⁺	311 [‡]	1588.3	(11 ⁻)	1277.2	(9 ⁻)
140 [‡] #	790.8	(5 ⁻)	650.6	(3 ⁻)	327.8 5	969.2	8 ⁺	641.4	6 ⁺
216 [‡] #	1006.4	(7 ⁻)	790.8	(5 ⁻)	358.6 5	1327.8	10 ⁺	969.2	8 ⁺
222.0 5	357.6	4 ⁺	135.6	2 ⁺	365.0 5	1006.4	(7 ⁻)	641.4	6 ⁺
260.5 8	1588.3	(11 ⁻)	1327.8	10 ⁺	379.1 5	1706.8	12 ⁺	1327.8	10 ⁺
271 [‡] #	1277.2	(9 ⁻)	1006.4	(7 ⁻)	391.8 [#] 6	2098.7?	(14 ⁺)	1706.8	12 ⁺
283.8 5	641.4	6 ⁺	357.6	4 ⁺	433.2 5	790.8	(5 ⁻)	357.6	4 ⁺
308.0 5	1277.2	(9 ⁻)	969.2	8 ⁺	515.0 6	650.6	(3 ⁻)	135.6	2 ⁺

[†] From **2020Bu20**.

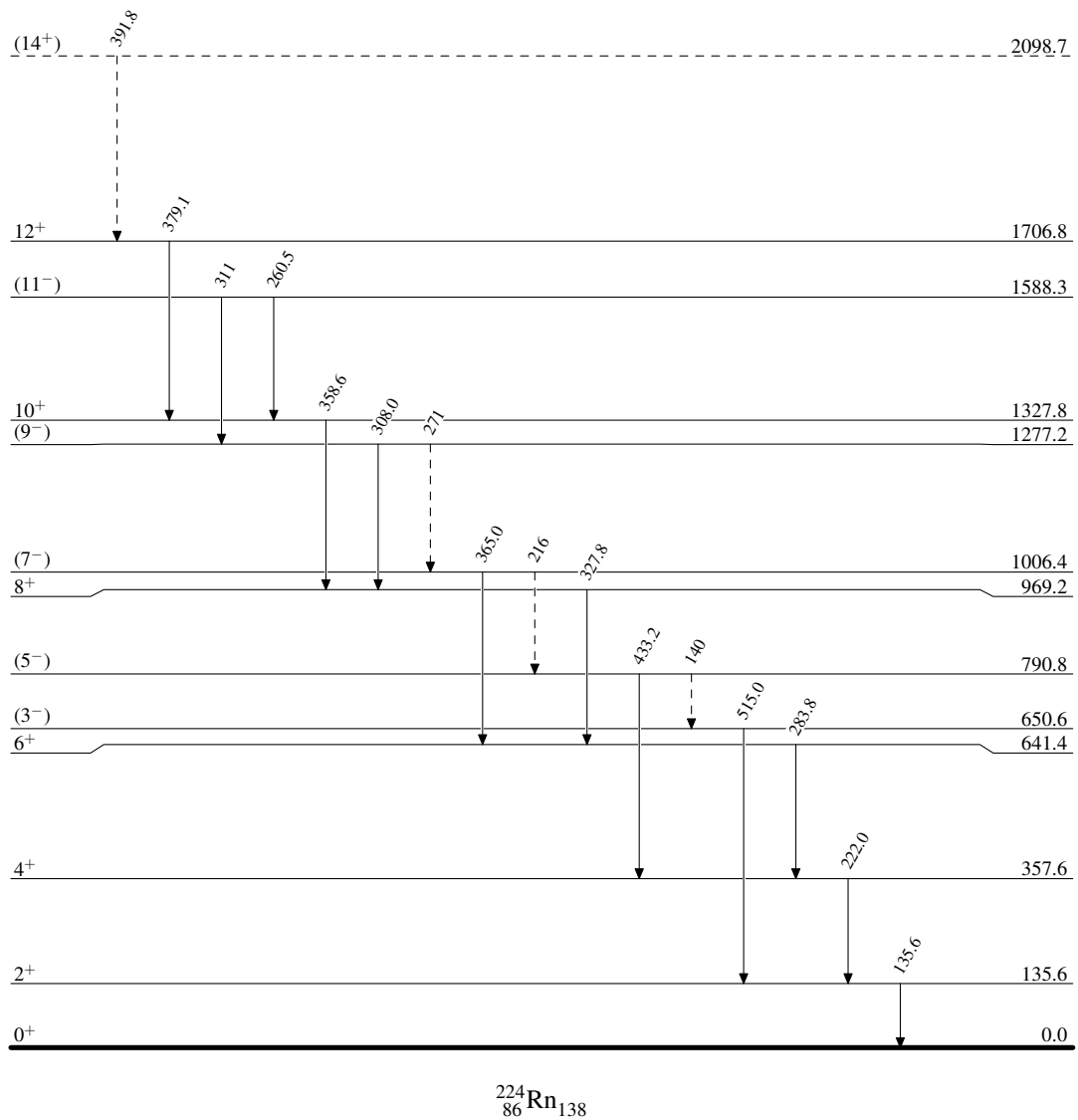
[‡] From Fig. 3 in **2020Bu20**.

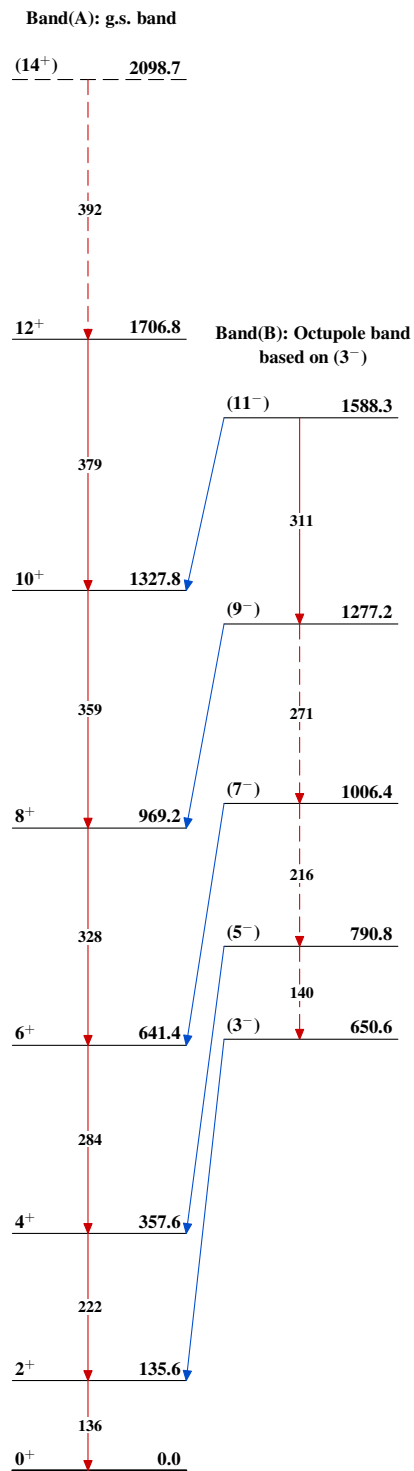
[#] Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

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