

$^{63}\text{Cu}(\text{p},\gamma)$ E=3.46 MeV **2020Sc04**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 178, 41 (2021).	12-Nov-2021

2020Sc04: E(p)=3.5 MeV. Measured $E\gamma$, $I\gamma$ values of primary γ rays using the HORUS array of BGO Compton-suppressed Ge detectors at the Cologne FN tandem van de Graaff accelerator. Deduced E1 γ -ray strength functions.

 ^{64}Zn Levels

E(level)	$J^{\pi\ddagger}$
0	0^+
992	2^+
1799	2^+
1910	0^+
2307	4^+
2609	0^+
2737	4^+
2793	2^+
2980	3^+
2998	3^-
3006	2^+
3079	4^+
3095	$(3)^+$
3187	1^+
3197	$(2,3)$
3206	$(3)^+$
3262	1
3297	$(2)^+$
3366	1^+
3370	3^+
3425	1^+
3454 [†]	I
3459	$(2,3)$
3546	(≤ 3)
3552	4^+
3597	$(2,3,4)$
3628	(4^+)
3707 [†]	I
3718	$(0^+ \text{ to } 4^+)$
3795	1^+
3819	$(0^+ \text{ to } 4^+)$
3851	$(\leq 3)^+$
3853	5^+
3899	$(2^+, 3, 4^+)$
3952	$(3^+, 4^+)$
4020	$(2^+, 3^+)$
4039	$(0^+ \text{ to } 4^+)$
4077	$(5)^+$
4115 [†]	I
4135 [†]	I
4157	5^-
4205	$(3^+, 4^+)$
4258 [†]	I
4311 [†]	I
4319	$(3^+, 4^+)$

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$^{63}\text{Cu}(\text{p},\gamma) \text{E}=3.46 \text{ MeV}$ **2020Sc04** (continued) ^{64}Zn Levels (continued)

E(level)	J^π	Comments
4357 [†] 1	(1 ⁺ , 2 ⁺ , 3 ⁺)	
4374 [†] 1		
4377 [†] 1		
4415 [†] 1		
4467	(0 ⁺)	
4559 [†] 1		
11120		E(level): from E(p)(lab)=3.46 MeV and S(p)(^{64}Zn)=7713.1 keV 6 (2021Wa16).

[†] New level proposed by **2020Sc04**.[‡] As given in **2020Sc04**, mostly taken from literature. $\gamma(^{64}\text{Zn})$

$E_i(\text{level})$	E_γ	I_γ	E_f	J_f^π	Comments
11120	6560	≥ 12.7	4559		
	6650	≥ 11.1	4467	(0 ⁺)	
	6700	≥ 7.0	4415		
	6740	≥ 5.4	4377		
	6750	≥ 11.0	4374		
	6760	≥ 5.2	4357	(1 ⁺ , 2 ⁺ , 3 ⁺)	
	6800	7.0 4	4319	(3 ⁺ , 4 ⁺)	
	6810	≥ 3.9	4311		
	6860	≥ 13.9	4258		
	6910	20.7 7	4205	(3 ⁺ , 4 ⁺)	
	6960	12 9	4157	5 ⁻	
	6980	≥ 4.9	4135	(1 ⁺ , 2 ⁺)	
	7010	≥ 2.3	4115	2 ⁺	
	7040	3.2 7	4077	(5) ⁺	Additional information 1.
	7080	24 5	4039	(0 ⁺ to 4 ⁺)	
	7100	8 8	4020	(2 ⁺ , 3 ⁺)	
	7170	2.7 3	3952	(3 ⁺ , 4 ⁺)	
	7220	22.1 20	3899	(2 ⁺ , 3, 4 ⁺)	
	7268	≥ 5.2	3853	5 ⁺	E_γ : 7.27 MeV in 2020Sc04 .
	7270	18 17	3851	(≤ 3) ⁺	
	7300	23 5	3819	(0 ⁺ to 4 ⁺)	
	7320	13 5	3795	1 ⁺	
	7400	≥ 13.9	3718	(0 ⁺ to 4 ⁺)	
	7420	19.9 8	3707	(2 ⁺)	
	7490	6.7 28	3628	(4 ⁺)	
	7520	15 10	3597	(2, 3, 4)	
	7570	15 10	3552	4 ⁺	
	7575	16 13	3546	(≤ 3)	E_γ : 7.57 MeV in 2020Sc04 .
	7660	28 8	3459	(2, 3)	
	7670	≥ 3.7	3454		
	7690	18 5	3425	1 ⁺	
	7750	61 22	3370	3 ⁺	
	7755	34 6	3366	1 ⁺	E_γ : 7.75 MeV in 2020Sc04 .
	7820	78 7	3297	(2) ⁺	
	7860	32 5	3262	1	
	7910	67 14	3206	(3) ⁺	
	7920	7.4 7	3197	(2, 3)	

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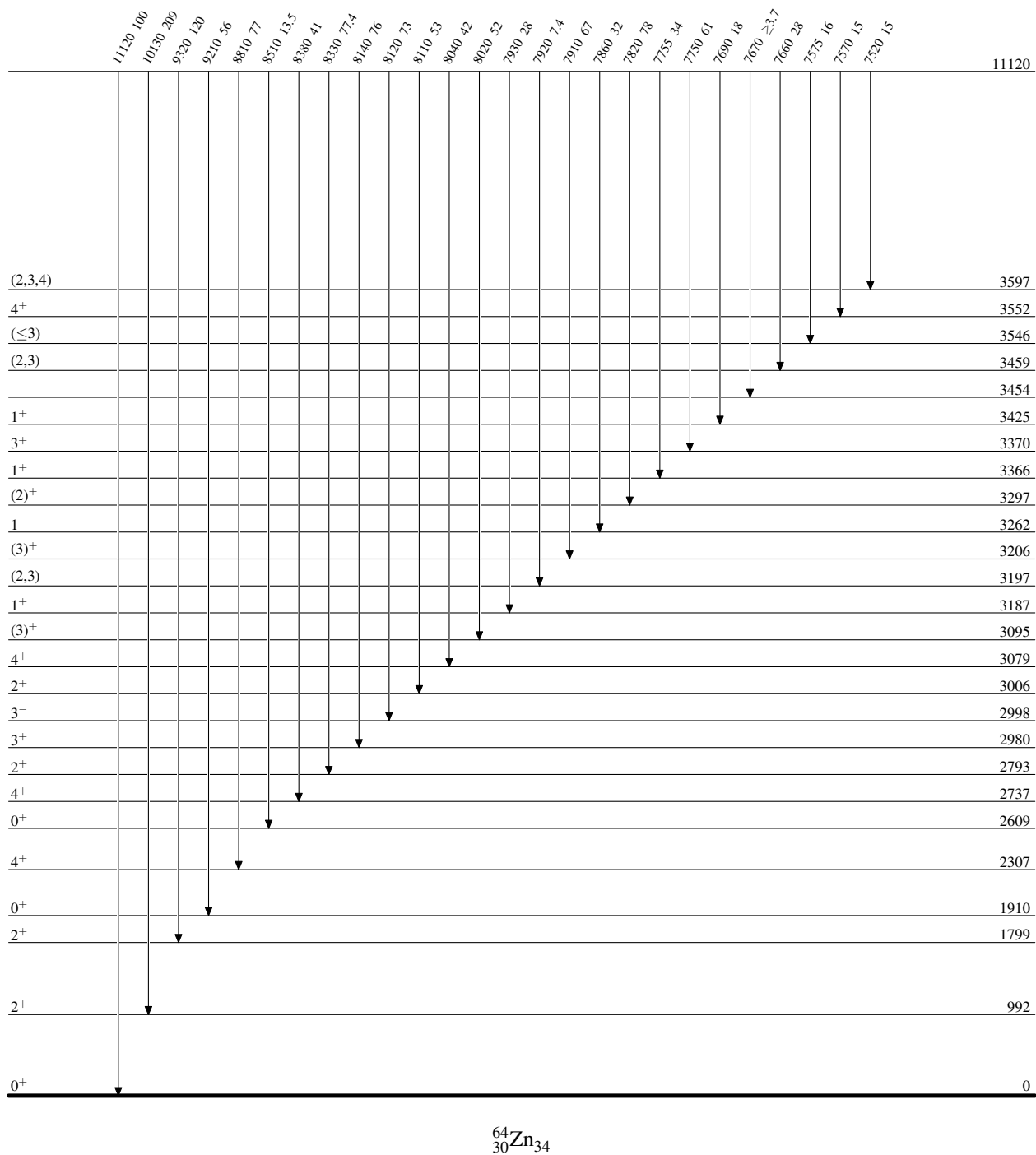
 $^{63}\text{Cu}(\text{p},\gamma) \text{E}=3.46 \text{ MeV}$ **2020Sc04** (continued)

 $\gamma(^{64}\text{Zn})$ (continued)

$E_i(\text{level})$	E_γ	I_γ	E_f	J_f^π	$E_i(\text{level})$	E_γ	I_γ	E_f	J_f^π
11120	7930	28 4	3187	1 ⁺	11120	8380	41 3	2737	4 ⁺
	8020	52 22	3095	(3) ⁺		8510	13.5 26	2609	0 ⁺
	8040	42 16	3079	4 ⁺		8810	77 3	2307	4 ⁺
	8110	53 7	3006	2 ⁺		9210	56 8	1910	0 ⁺
	8120	73 33	2998	3 ⁻		9320	120 18	1799	2 ⁺
	8140	76 5	2980	3 ⁺		10130	209 8	992	2 ⁺
	8330	77.4 13	2793	2 ⁺		11120	100 6	0	0 ⁺

$^{63}\text{Cu}(\text{p},\gamma)$ E=3.46 MeV 2020Sc04Level Scheme

Intensities: Relative photon branching from each level

 $^{64}_{30}\text{Zn}_{34}$

$^{63}\text{Cu}(\text{p},\gamma)$ E=3.46 MeV 2020Sc04Level Scheme (continued)

Intensities: Relative photon branching from each level

