

$^{20}\text{Ne}(\alpha,\gamma)$:Resonances **1983Sc17,1978Fi08**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia, Anagha Chakraborty		NDS 186, 2 (2022)	31-Mar-2022

Others: **1954Go70** (α,α_0), **1965Sm03**, **1968Hi02**, **1968Ro05**, **1972Mc09**, **1973Br33** ($\alpha,\alpha\gamma$), **1977Fi07**, **1979Fi03**, **1997Wi12**.
1983Sc17: $^{20}\text{Ne}(\alpha,\gamma)$, E=0.55-3.2 MeV. Measured $E\gamma, I\gamma(E,\theta)$. Windowless gas targets of the extended and jet type, enriched ^{20}Ne gas, Ge(Li) detectors.

1979Fi03, **1978Fi08**: $^{20}\text{Ne}(\alpha,\gamma)$, E=2.6-6.0 MeV. Measured $\sigma(E\alpha, E\gamma, \theta\gamma)$, NaI(Tl), Ge(Li) detectors. Also ($\alpha,\alpha'\gamma$) (**1978Fi08**).

 ^{24}Mg Levels

E(level) [†]	J ^π [‡]	$\Gamma^{\#}$	$\omega\gamma^{\&}$	Comments
0	0 ⁺			
1368.7	2 ⁺	1.56 ps 6		Γ : From $\tau=2.25$ ps 9 (1973Br33).
4122.9	4 ⁺			
4238.4	2 ⁺			
5235.2	3 ⁺			
6010.3	4 ⁺			
6432.2	0 ⁺			
7348.6	2 ⁺			
7555.3	1 ⁻			E(level): 20% of the deexcitation intensity of this level is unknown.
7616.4	3 ⁻			E(level): 13% of the deexcitation intensity of this level is unknown.
7747.7	1 ⁺			
7812.4	(4 ⁻ , 5 ⁺)			
8358.1	3 ⁻			E(level): 29% of the deexcitation intensity of this level is unknown.
8438.3	4 ⁺			
8438.4	1 ⁻			
8654.9	2 ⁺			E(level): 13% of the deexcitation intensity of this level is unknown.
8864.5	2 ⁻			
9003.5	2 ⁺			E(level): 50% of the deexcitation intensity of this level is unknown.
9284.4	2 ⁺ , 4 ⁺			
9299.8				E(level): Other: Doublet in (α,γ).
9301.1	(4 ⁺)			E(level): Doublet in (α,γ).
9457.8 7	(3) ⁺			E(level): 10% of the deexcitation intensity of this level is unknown.
9516.2	4 ⁺			
9828.0	1 ⁺			E(level): 15% of the deexcitation intensity of this level is unknown.
9965.3	1 ⁺			E(level): 10% of the deexcitation intensity of this level is unknown.
10030	5 ⁻		<0.0008	$E\alpha=856$ (Lab) (calculated value in 1983Sc17).
10065	1, 2 ⁺		<0.0008	$E\alpha=898$ (Lab) (calculated value in 1983Sc17).
10115 3		<5 [@] keV	0.00029 6	$E\alpha=958$ 3 (Lab) (1983Sc17).
10165			<0.0008	$E\alpha=1018$ (Lab) (calculated value in 1983Sc17).
10338 3	3 ⁻	<7 [@] keV	0.00030 6	$E\alpha=1226$ 3 (Lab) (1983Sc17).
10367 3	2 ⁺	<6 [@] keV	0.00048 10	$E\alpha=1260$ 3 (Lab) (1983Sc17).
10583	4 ⁺		<0.0002	$E\alpha=1519$ (Lab) (calculated value in 1983Sc17).
10664	0 ⁻ , 1, 2 ⁺		<0.0002	$E\alpha=1617$ (Lab) (calculated value in 1983Sc17).
10684 2	0 ⁺	<3 [@] keV	0.17 2	$E\alpha=1640$ 2 (Lab) (1983Sc17).
10737 2	2 ⁺		0.0026 5	$E\alpha=1704$ 2 (Lab) (1983Sc17).
				J ^π : D to 2 ⁺ ($\Delta J=0$) (1983Sc17).
10829			<0.0002	$E\alpha=1814$ (Lab) (calculated value in 1983Sc17).
10924	2 ⁺	<1 [@] keV	2.2 3	$E\alpha=1928$ (Lab) (calculated value in 1983Sc17).
11014 3	3, 5 ⁺		<0.001	$E\alpha=2037$ 3 (Lab) (1983Sc17 – uncertainty of the excitation energy from text).
				J ^π : From γ -ray angular distribution measurements (1983Sc17).
11020 3	2 ⁺	<3 [@] keV	1.5 2	$E\alpha=2044$ 3 (Lab) (1983Sc17).
11133 3			<0.004	$E\alpha=2179$ (Lab) (calculated value in 1983Sc17).
				$\omega\gamma=40$ μeV 10 (1997Wi12).

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$^{20}\text{Ne}(\alpha,\gamma)$:Resonances **1983Sc17,1978Fi08** (continued) ^{24}Mg Levels (continued)

E(level) [†]	J ^π [‡]	Γ [#]	ωγ ^{&}	Comments
11167 2	3 ⁻	<3 [@] keV	0.22 6	Eα=2220 2 (Lab) (1983Sc17).
11185			<0.004	Eα=2242 (Lab) (calculated value in 1983Sc17).
11190			<0.004	Eα=2248 (Lab) (calculated value in 1983Sc17).
11215 3		<4 [@] keV	0.0027 14	Eα=2277 3 (Lab) (1983Sc17).
11226 3	4 ⁺	<4 [@] keV	1.7 2	Eα=2291 3 (Lab) (1983Sc17).
11298			<0.004	Eα=2377 (Lab) (1983Sc17).
11323			<0.004	Eα=2407 (Lab) (1983Sc17).
11335			<0.004	Eα=2421 (Lab) (1983Sc17).
11395 3	1 ⁻	0.5 [@] keV	0.46 10	Eα=2493 3 (Lab) (1983Sc17).
11457 3	2 ⁺	<2 [@] keV	1.2 2	Eα=2568 3 (Lab) (1983Sc17).
				1983Sc17 show a transition of 0.4 I feeding 10712, probably a typo, evaluators are not sure about the feeding level – so not listing in the dataset. In previous evaluation (2007Fi14) the transition was listed as 740.
11461 4			<0.02	Eα=2573 5 (Lab) (1954Go70). Other: 2572 (Lab) (1983Sc17).
11523 2	2 ⁺	0.5 [@] keV	0.8 2	Eα=2647 2 (Lab) (1983Sc17).
11600 2	3 ⁻	<5 [@] keV	0.037 11	Eα=2740 2 (Lab) (1983Sc17).
11623			<0.01	Eα=2767 (Lab) (1983Sc17).
11700 2	4 ⁺	<2 [@] keV	1.1 2	Eα=2860 2 (Lab) (1983Sc17).
11732 2	0 ⁺	10 [@] keV 2	0.37 6	Eα=2898 2 (Lab) (1983Sc17).
11833			<0.016	Eα=3019 (Lab) (1983Sc17).
11865 3			<0.016	Eα=3057 (Lab) (1983Sc17).
11869 3	1 ⁻	7.0 keV 3	1.0 2	Eα=3062 3 (Lab) (1983Sc17).
				Γ: Other value 8 keV 2 in 1983Sc17 and 1954Go70.
11908 3		5.5 keV 22		E(level): Eα=3109 4 (Lab) (1978Fi08).
11935			<0.04	Eα=3141 (Lab) (1983Sc17). 3143 in 1990En08.
11976 3	2 ⁺	2.4 keV 5	0.85 10	E(level): Eα=3190 3 (Lab) (1983Sc17).
				Γ: Weighted average of 2.8 keV 3 (1978Fi08) and 1.8 keV 4 (1963Fi09).
12004 4		<1 keV		Eα=3224 5 (Lab) (1978Fi08).
12017 4		0.7 keV 2		Eα=3240 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =3 ⁻ from 1973EnVA.
				Γ: From 1963Fi09. Other: < 1 keV (1978Fi08).
12051 4		<0.02 keV		Eα=3281 5 (Lab) (1978Fi08).
				Γ: From 1960Wa05. Other: < 1 keV (1978Fi08).
12122 4		1.9 keV 3		Eα=3366 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =4 ⁺ from 1973EnVA.
12163 4		0.9 keV 3		Eα=3415 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =4 ⁺ from 1973EnVA.
12259 4		1.8 keV 3		Eα=3530 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =3 ⁻ from 1973EnVA.
12406 4		<0.1 keV		Eα=3707 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =2 ⁺ from 1973EnVA.
				Γ: From 1960Wa05. Other: < 1 keV (1978Fi08).
12446 4		<1 keV		Eα=3754 5 (Lab) (1978Fi08).
12456 4		5.7 keV 4		Eα=3766 5 (Lab) (1978Fi08). Other: 3780 4 (Lab) (1954Go70).
				Γ: Other value 7 keV 2 from 1954Go70.
12467 4				Eα=3780 5 (Lab) (1978Fi08).
12472 4		3.8 keV 3		Eα=3786 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =2 ⁺ from 1973EnVA.
				Γ: Other value 5 keV 1 from 1954Go70.
12508 4		2.3 keV 3		Eα=3829 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =4 ⁺ from 1973EnVA.
12580 4		6.2 keV 6		Eα=3915 5 (Lab) (1978Fi08).
				J ^π : 1978Fi08 list J ^π =2 ⁺ from 1973EnVA.
				Γ: Other value 6 keV 1 from 1954Go70.

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$^{20}\text{Ne}(\alpha,\gamma)$:Resonances **1983Sc17,1978Fi08** (continued) ^{24}Mg Levels (continued)

E(level) [†]	J ^π [‡]	Γ [#]	Comments
12641 4		0.03 keV 2	Eα=3988 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =4 ⁺ from 1973EnVA. Γ: From 1967Mo17. Other: < 1 keV (1978Fi08).
12663 4		0.9 keV 3	Eα=4015 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =3 ⁻ from 1973EnVA.
12742 4		8.3 keV 5	Eα=4109 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =2 ⁺ from 1973EnVA.
12812 4		2.3 keV 3	Eα=4193 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =2 ⁺ from 1973EnVA.
12851 4		<1 keV	Eα=4240 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =2 ⁺ from 1973EnVA. Γ: From 1978Fi08.
12865 4	2 ⁺ ,3 ⁻	<1 keV	Eα=4257 5 (Lab) (1978Fi08). J ^π : From Adopted Levels. 1978Fi08 list J ^π =6 ⁺ from their earlier work 1973Fi13 ($^{12}\text{C},\alpha$), not confirmed by any other works.
12925 4		6.7 keV 6	Eα=4329 5 (Lab) (1978Fi08).
12977 4		3.3 keV 3	Eα=4391 5 (Lab) (1978Fi08).
13047 4	0 ⁺	2.3 keV 4	Eα=4475 5 (Lab) (1978Fi08). J ^π : D γ to 1 ⁺ , based on γγ(θ) (1978Fi08).
13053 4		0.09 keV 3	Eα=4483 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =4 ⁺ from 1973EnVA. Γ: From 1967Mo17. Other: < 1 keV (1978Fi08).
13061 4		<1 keV	Eα=4492 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =5 ⁻ from 1973EnVA.
13091 4		11.9 keV 6	Eα=4528 5 (Lab) (1978Fi08). J ^π : 1978Fi08 list J ^π =(2 ⁺ ,3) from 1973EnVA.
13136 4		9 keV 2	Eα=4582 5 (Lab) (1978Fi08).
13141 4		5.4 keV 5	Eα=4588 5 (Lab) (1978Fi08).
13187 4		5.6 keV 4	Eα=4643 5 (Lab) (1978Fi08). Γ: From 1978Fi08.
13202 4		2.7 keV 4	Eα=4661 5 (Lab) (1978Fi08).
13260 4		36 keV 3	Eα=4731 5 (Lab) (1978Fi08).
13338 4		33 keV 3	Eα=4824 5 (Lab) (1978Fi08).
13413 4		2.8 keV 3	Eα=4915 5 (Lab) (1978Fi08).
13424 4		3.2 keV 7	Eα=4928 5 (Lab) (1978Fi08). Γ: From 1978Fi08.
13436 4		15.0 keV 25	Eα=4942 5 (Lab) (1978Fi08).
13443 4		<1 keV	Eα=4950 5 (Lab) (1978Fi08).
13487 4		1.2 keV 3	Eα=5003 5 (Lab) (1978Fi08).
13588 4		21 keV 2	Eα=5124 5 (Lab) (1978Fi08). Γ: from 1978Fi08.
13678 4		4.8 keV 8	Eα=5232 5 (Lab) (1978Fi08).
13722 4		4.3 keV 3	Eα=5285 5 (Lab) (1978Fi08).
13768 4		3.2 keV 4	Eα=5340 5 (Lab) (1978Fi08).
13799 4		4.4 keV 4	Eα=5378 5 (Lab) (1978Fi08).
13850 4		<1 keV	
13885 4		12.0 keV 18	
14026 4		6.2 keV 7	Eα=5650 5 (Lab) (1978Fi08).
14080 4		24 keV 5	Eα=5715 5 (Lab) (1978Fi08).
14084 4		<1 keV	Eα=5720 5 (Lab) (1978Fi08). J ^π : 6 ⁺ in 1978Fi08.
14101 4		1.4 keV 4	Eα=5740 5 (Lab) (1978Fi08).
14150 4		1.8 keV 4	Eα=5799 5 (Lab) (1978Fi08).
14152 4		6.2 keV 7	Eα=5801 5 (Lab) (1978Fi08). Γ _γ =0.085 eV 23 (1977Fi07).
14157 4			Eα=5807 5 (Lab) (1978Fi08).

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$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08 (continued) ^{24}Mg Levels (continued)

<u>E(level)[†]</u>	<u>$\Gamma^{\#}$</u>	<u>Comments</u>
14245 4	11.3 keV 14	$E\alpha=5913\ 5$ (Lab) (1978Fi08).
14329 4	<1 keV	$E\alpha=6014\ 5$ (Lab) (1978Fi08).

[†] Up to 9965 from Adopted Levels, rounded value. Above energies are from reported $E\alpha$ in 1978Fi08, except otherwise noted, using $Q(\alpha)(^{24}\text{Mg})=9316.562$ keV 13 (2021Wa16), $m(^{20}\text{Ne})=19.99244$ amu, and $m(^{24}\text{Mg})=23.98504$ amu. $E\alpha$ with uncertainty correspond to observed resonances in 1983Sc17 and others are calculated value (from E_x and Q), and listed only if J^π assignment involve natural parity.

[‡] From $\alpha\gamma$ angular correlation measurements (1983Sc17, 1965Sm03). Natural parity states are expected to excite for resonance levels for this reaction. Spin-parity for levels up to 9965 are from Adopted Levels.

[#] From 1978Fi08, except where otherwise noted.

@ From 1983Sc17.

& in units of eV from 1983Sc17.

 $\gamma(^{24}\text{Mg})$

<u>$E_i(\text{level})$</u>	<u>J_i^π</u>	<u>$E_\gamma^{\dagger}$</u>	<u>$I_\gamma^{\ddagger}$</u>	<u>E_f</u>	<u>J_f^π</u>
1368.7	2 ⁺	1368.7	100	0	0 ⁺
4122.9	4 ⁺	2754	100	1368.7	2 ⁺
4238.4	2 ⁺	2870	23 2	1368.7	2 ⁺
		4238.3	77 2	0	0 ⁺
5235.2	3 ⁺	997.1	1.0 5	4238.4	2 ⁺
		3866	99.0 5	1368.7	2 ⁺
6010.3	4 ⁺	1771.9	7 3	4238.4	2 ⁺
		4641	93 3	1368.7	2 ⁺
6432.2	0 ⁺	2193.4	20 10	4238.4	2 ⁺
		5062.9	80 10	1368.7	2 ⁺
7348.6	2 ⁺	5979.1	38 5	1368.7	2 ⁺
		7347.4	62 5	0	0 ⁺
7555.3	1 ⁻	6185.7	35 10	1368.7	2 ⁺
		7554.0	45 10	0	0 ⁺
7616.4	3 ⁻	3493.2	5 2	4122.9	4 ⁺
		6246.8	58 5	1368.7	2 ⁺
		7615.1	24 5	0	0 ⁺
7747.7	1 ⁺	6378.1	75 5	1368.7	2 ⁺
		7746.4	25 5	0	0 ⁺
7812.4	(4 ⁻ ,5 ⁺)	1802.0	22 5	6010.3	4 ⁺
		2577.1	59 3	5235.2	3 ⁺
		3689.2	19 5	4122.9	4 ⁺
8358.1	3 ⁻	2347.7	6 5	6010.3	4 ⁺
		3122.7	17 5	5235.2	3 ⁺
		6988.3	48 5	1368.7	2 ⁺
8438.3	4 ⁺	4199.5	8 5	4238.4	2 ⁺
		4314.9	23 5	4122.9	4 ⁺
		7068.5	69 5	1368.7	2 ⁺
8438.4	1 ⁻	7068.6	20 10	1368.7	2 ⁺
		8436.8	80 10	0	0 ⁺
8654.9	2 ⁺	4416.1	18 5	4238.4	2 ⁺
		7285.0	69 5	1368.7	2 ⁺
8864.5	2 ⁻	4625.6	11 5	4238.4	2 ⁺
		7494.5	89 5	1368.7	2 ⁺
9003.5	2 ⁺	9001.7	50 10	0	0 ⁺

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$^{20}\text{Ne}(\alpha,\gamma)$:Resonances **1983Sc17,1978Fi08** (continued) $\gamma(^{24}\text{Mg})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.	Comments
9284.4	$2^+, 4^+$	5160.9	15 5	4122.9	4^+		
		7914.3	85 5	1368.7	2^+		
9299.8		5176.3	45 10	4122.9	4^+		
		7929.7	55 10	1368.7	2^+		
9457.8	$(3)^+$	8087.6	90 15	1368.7	2^+		
9516.2	4^+	1077.9	40 15	8438.3	4^+		
		5392.7	60 15	4122.9	4^+		
9828.0	1^+	9825.8	85 10	0	0^+		
9965.3	1^+	9963.1	90 20	0	0^+		
10115		8745	100	1368.7	2^+		
10338	3^-	8967.5	100	1368.7	2^+		$A_2=+0.5$ 6; $A_4=+1.8$ 10
10367	2^+	8997	53 8	1368.7	2^+		$A_2=+0.5$ 6
		10365	47 8	0	0^+		$A_2=+0.9$ 5; $A_4=-0.9$ 10
10684	0^+	3129	0.5 3	7555.3	1^-		
		3335	2.0 3	7348.6	2^+		
		6445	12.5 10	4238.4	2^+		
		9313	85 2	1368.7	2^+		
10737	2^+	6497.7	27 3	4238.4	2^+	D	$A_2=+0.7$ 3
		9366.3	73 3	1368.7	2^+		$A_2=+0.5$ 1
10924	2^+	4491	0.4 1	6432.2	0^+		$A_2=+0.2$ 7; $A_4=-1.3$ 13
		4913	0.8 1	6010.3	4^+		$A_2=+0.4$ 2
		5688	1.3 1	5235.2	3^+		$A_2=-1.2$ 1
		6685	0.5 1	4238.4	2^+		$A_2=-0.2$ 4
		6800	16 1	4122.9	4^+		$A_2=+0.26$ 7
		9553	47 2	1368.7	2^+		$A_2=-0.45$ 6
		10921	34 2	0	0^+		$A_2=+1.3$ 4; $A_4=-1.0$ 6
11014	$3,5^+$	2576	57 [#] 6	8438.3	4^+		
		5003	27 [#] 5	6010.3	4^+		
11020	2^+	1055	2.0 5	9965.3	1^+		$A_2=-0.8$ 1
		3272	0.5 1	7747.7	1^+		$A_2=-0.4$ 4
		3469	0.3 1	7555.3	1^-		$A_2=+0.2$ 11
		5009	0.7 1	6010.3	4^+		$A_2=+0.4$ 3
		5784	1.2 2	5235.2	3^+		$A_2=+0.3$ 2
		6781	1.9 3	4238.4	2^+		$A_2=+0.0$ 3
		6896	0.8 2	4122.9	4^+		$A_2=+0.1$ 5
		9649	81 2	1368.7	2^+		$A_2=+1.1$ 3
		11017	11.5 10	0	0^+		$A_2=+1.3$ 6; $A_4=-0.9$ 9
11133		3516		7616.4	3^-		E_γ : As of 1997Wi12.
11167	3^-	2728	4.2 2	8438.3	4^+		$A_2=+0.2$ 4; $A_4=-1.0$ 9
		3616	4.5 2	7555.3	1^-		$A_2=+0.8$ 6; $A_4=-0.8$ 10
		5156	9.4 2	6010.3	4^+		$A_2=+0.21$ 15
		5931	8.1 2	5235.2	3^+		$A_2=+0.4$ 1
		7043	1.3 1	4122.9	4^+		$A_2=-0.3$ 4
		9796	72 2	1368.7	2^+		$A_2=-0.51$ 4
		11164	0.5 1	0	0^+		$A_2=+1.9$ 6; $A_4=+1.8$ 9
							E_γ : Weak transition 3^- to 0^+ . Not Adopted.
11215		9844	100	1368.7	2^+		$A_2=+0.6$ 1
11226	4^+	1710	1.2 1	9516.2	4^+		$A_2=+0.2$ 1
		2571	0.7 1	8654.9	2^+		$A_2=+0.0$ 11; $A_4=-1.2$ 14
		3877	0.3 1	7348.6	2^+		
		5984	0.8 1	5235.2	3^+		$A_2=+0.1$ 5
		7102	11 1	4122.9	4^+		$A_2=+0.7$ 1
		9855	86 2	1368.7	2^+		$A_2=+1.0$ 4; $A_4=+0.3$ 6
11395	1^-	1330	1.3 2	10065	$1,2^+$		$A_2=+0.0$ 2
		1430	0.7 1	9965.3	1^+		$A_2=+0.5$ 3

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$^{20}\text{Ne}(\alpha,\gamma)$:Resonances **1983Sc17,1978Fi08** (continued) $\gamma(^{24}\text{Mg})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Comments
11395	1^-	2956	0.7 1	8438.4	1^-	$A_2=+0.9$ 4
		3647	1.0 1	7747.7	1^+	$A_2=+0.8$ 2
		4962	0.8 1	6432.2	0^+	$A_2=-0.7$ 2
		7155	1.5 2	4238.4	2^+	$A_2=+0.0$ 2
		10024	69 2	1368.7	2^+	$A_2=+0.2$ 1
		11392	25 1	0	0^+	$A_2=-1.1$ 1
11457	2^+	720	1.5 2	10737	2^+	$A_2=+0.5$ 1
		1392	0.5 1	10065	$1,2^+$	$A_2=+0.0$ 2
		1492	5.6 3	9965.3	1^+	$A_2=-0.36$ 4
		3709	1.4 2	7747.7	1^+	$A_2=+0.8$ 1
		3840	0.4 2	7616.4	3^-	$A_2=+0.3$ 2
		4108	0.6 1	7348.6	2^+	$A_2=+0.4$ 2
		6221	1.8 2	5235.2	3^+	$A_2=+0.7$ 2
		7217	21 1	4238.4	2^+	$A_2=+1.2$ 1
		7333	0.8 1	4122.9	4^+	$A_2=+0.0$ 5
		10086	44 1	1368.7	2^+	$A_2=-0.4$ 1
		11454	22 1	0	0^+	$A_2=+1.3$ 7; $A_4=-0.9$ 9
		786	1.0 1	10737	2^+	$A_2=+1.3$ 6; $A_4=-0.9$ 9
		1458	1.3 2	10065	$1,2^+$	$A_2=-0.1$ 2
		1558	0.7 1	9965.3	1^+	$A_2=+0.3$ 1
11523	2^+	3160	0.2 1	8358.1	3^-	$A_2=-0.3$ 1
		3775	0.7 1	7747.7	1^+	$A_2=+0.5$ 2; $A_4=-1.9$ 4
		3906	0.9 1	7616.4	3^-	$A_2=+0.4$ 1
		5090	7.7 3	6432.2	0^+	$A_2=-1.5$ 5
		7283	5.1 2	4238.4	2^+	$A_2=-0.1$ 7
		7399	4.4 2	4122.9	4^+	$A_2=+0.0$ 2
		10152	15 1	1368.7	2^+	$A_2=+0.9$ 1
		11520	63 2	0	0^+	$A_2=+0.6$ 1
		2084	9.6 6	9516.2	4^+	$A_2=+1.6$ 5
		2299	33 2	9301.1	(4^+)	$A_2=+0.9$ 2
		2300	2.6 6	9299.8		$A_2=+1.0$ 3
11600	3^-	2315	5.5 5	9284.4	$2^+,4^+$	$A_2=+0.1$ 2
		3242	3.6 3	8358.1	3^-	$A_2=-0.3$ 1
		3983	44 2	7616.4	3^-	$A_2=-0.3$ 1
		7476	1.7 2	4122.9	4^+	$A_2=+0.1$ 2
		686	0.8 1	11014	$3,5^+$	$A_2=+0.04$ 14
		2399	44 2	9301.1	(4^+)	$A_2=+0.5$ 1
		2400	0.5 2	9299.8		$A_2=+0.4$ 5
		3045	1.1 2	8654.9	2^+	$A_2=-0.2$ 9; $A_4=-1.2$ 15
		3261	1.6 2	8438.3	4^+	$A_2=+1.0$ 2
		3887	0.6 2	7812.4	$(4^-,5^+)$	$A_2=-0.9$ 12
11700	4^+	4351	2.6 2	7348.6	2^+	$A_2=+0.8$ 6; $A_4=+1.0$ 6
		5689	2.2 2	6010.3	4^+	$A_2=+0.0$ 3
		6464	3.0 2	5235.2	3^+	$A_2=+0.8$ 4; $A_4=+1.0$ 6
		7460	8.7 4	4238.4	2^+	$A_2=+0.9$ 5; $A_4=+0.0$ 8
		7576	6.9 4	4122.9	4^+	$A_2=+0.1$ 1
		10329	28 2	1368.7	2^+	$A_2=+1.1$ 4; $A_4=+0.4$ 6
		11732	0 ⁺	1767	3.2 2	
			4176	1.5 1	7555.3	1^-
			7492	3.3 2	4238.4	2^+
			10361	92 2	1368.7	2^+
			4313	2.5 2	7555.3	1^-
11869	1^-		4520	1.0 1	7348.6	2^+
			7629	2.5 2	4238.4	2^+
			10498	37 2	1368.7	2^+
			11866	57 2	0	0^+

Continued on next page (footnotes at end of table)

$^{20}\text{Ne}(\alpha,\gamma)$:Resonances **1983Sc17,1978Fi08** (continued) $\gamma(^{24}\text{Mg})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Comments
11976	2 ⁺	761	0.3 1	11215		$A_2=-0.5$ 7
		1239	1.3 2	10737	2 ⁺	$A_2=+0.6$ 2
		1911	4.2 2	10065	1,2 ⁺	$A_2=+0.5$ 1
		2011	1.7 2	9965.3	1 ⁺	$A_2=-1.2$ 4
		5543	3.3 2	6432.2	0 ⁺	$A_2=+0.9$ 4; $A_4=-1.7$ 8
		6740	21 1	5235.2	3 ⁺	$A_2=-0.6$ 1
		7736	16 1	4238.4	2 ⁺	$A_2=+0.4$ 1
		7852	1.2 1	4122.9	4 ⁺	$A_2=+0.8$ 4
		10605	35 2	1368.7	2 ⁺	$A_2=+1.1$ 1
		11973	16 1	0	0 ⁺	$A_2=+0.8$ 8; $A_4=-1.9$ 12
12004		990	12 [#] 2	11014	3,5 ⁺	
		3565	6 [#] 1	8438.3	4 ⁺	
		5993	19 [#] 2	6010.3	4 ⁺	
		7880	63 [#] 2	4122.9	4 ⁺	
12051		6040	5,0 ^{&} 5	6010.3	4 ⁺	
		6815	22 ^{&} 1	5235.2	3 ⁺	
		7927	72 ^{&} 2	4122.9	4 ⁺	
		10680	1,0 ^{&} 2	1368.7	2 ⁺	
12122		2606	37 ^{&} 3	9516.2	4 ⁺	
		6111	10 ^{&} 2	6010.3	4 ⁺	
		7882	34 ^{&} 2	4238.4	2 ⁺	
		7998	14 ^{&} 2	4122.9	4 ⁺	
		10751	5 ^{&} 1	1368.7	2 ⁺	
12163		2647	9 ^{&} 1	9516.2	4 ⁺	
		3159	2,0 ^{&} 5	9003.5	2 ⁺	
		6927	3 ^{&} 1	5235.2	3 ⁺	
		7923	6 ^{&} 1	4238.4	2 ⁺	
		8039	51 ^{&} 3	4122.9	4 ⁺	
		10792	29 ^{&} 3	1368.7	2 ⁺	
12446		2416	100 [@]	10030	5 ⁻	
12508		5159	3,0 ^{&} 5	7348.6	2 ⁺	
		7272	8 ^{&} 1	5235.2	3 ⁺	
		8268	24 ^{&} 2	4238.4	2 ⁺	
		8384	13 ^{&} 2	4122.9	4 ⁺	
		11137	52 ^{&} 3	1368.7	2 ⁺	
12663		1926	2 ^a 1	10737	2 ⁺	
		2598	6 ^a 1	10065	1,2 ⁺	
		3147	8 ^a 1	9516.2	4 ⁺	
		3798	10 ^a 2	8864.5	2 ⁻	
		4915	2 ^a 1	7747.7	1 ⁺	
		5314	7 ^a 1	7348.6	2 ⁺	
		7427	3 ^a 1	5235.2	3 ⁺	
		8423	37 ^a 4	4238.4	2 ⁺	
		8538	6 ^a 1	4122.9	4 ⁺	
		11291	19 ^a 2	1368.7	2 ⁺	
12865	2 ⁺ ,3 ⁻	3564	25 [#] 2	9301.1	(4 ⁺)	
		4426	19 [#] 2	8438.3	4 ⁺	
		6854	48 [#] 2	6010.3	4 ⁺	

Continued on next page (footnotes at end of table)

$^{20}\text{Ne}(\alpha,\gamma)$:Resonances [1983Sc17](#),[1978Fi08](#) (continued) $\gamma(^{24}\text{Mg})$ (continued)

$E_i(\text{level})$	J_i^π	$E_\gamma^\dagger$	$I_\gamma^\ddagger$	E_f	J_f^π	Mult.	Comments
12865	$2^+, 3^-$	8740	$9^\# 2$	4122.9	4^+		
13047	0^+	3081	$30^\# 3$	9965.3	1^+		
		3219	$43^\# 3$	9828.0	1^+	D	Mult.: From $\gamma\gamma(\theta)$ (1978Fi08).
		4608	$13^\# 2$	8438.4	1^-		
		5299	$10^\# 2$	7747.7	1^+		
		5491	$6^\# 2$	7555.3	1^-		
13061		2723	$10^\text{@} 2$	10338	3^-		
		4702	$9^\text{@} 2$	8358.1	3^-		
		5444	$10^\text{@} 2$	7616.4	3^-		
		8936	$61^\text{@} 3$	4122.9	4^+		
13443		9318	$100^\#$	4122.9	4^+		
13768		5409	$58^\text{@} 6$	8358.1	3^-		
		9643	$42^\text{@} 6$	4122.9	4^+		
14084		3070	$18^\# 2$	11014	$3, 5^+$		
		4782	$1.0^\# 4$	9301.1	(4^+)		
		8072	$36^\# 3$	6010.3	4^+		
		9959	$45^\# 3$	4122.9	4^+		

† From level energy differences, recoil energy subtracted.

‡ From [1983Sc17](#), except where otherwise noted.

$^\#$ From [1978Fi08](#).

$^\text{@}$ From [1979Fi03](#).

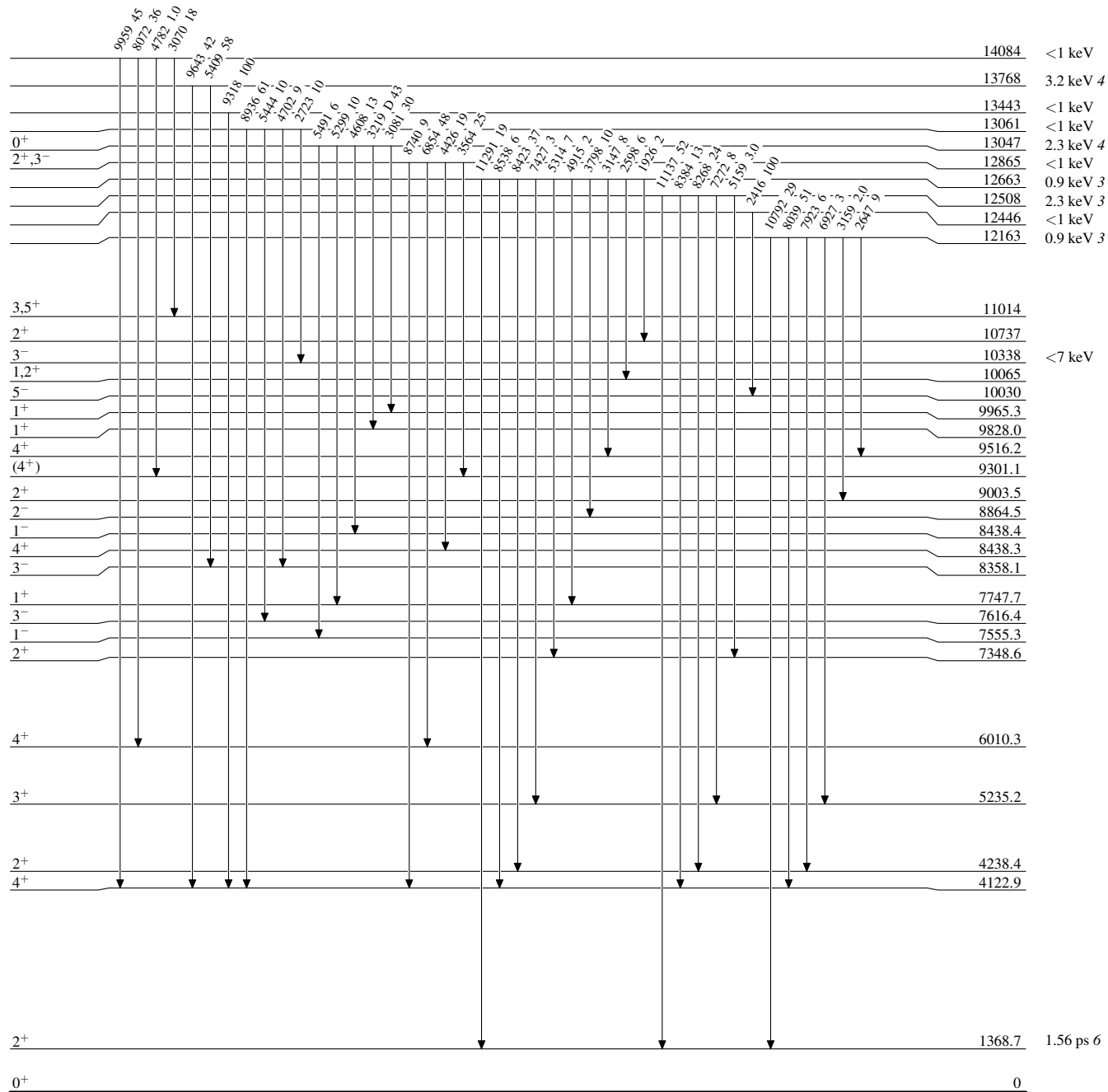
$^\&$ Based on data in [1978Fi08](#), [1979Fi03](#), and [1983Sc17](#) (also in [1990En08](#), Table 24.14).

a Deexcitation intensity for 12660-12662 (Previous value 12657-12659) keV doublet.

$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08

Level Scheme

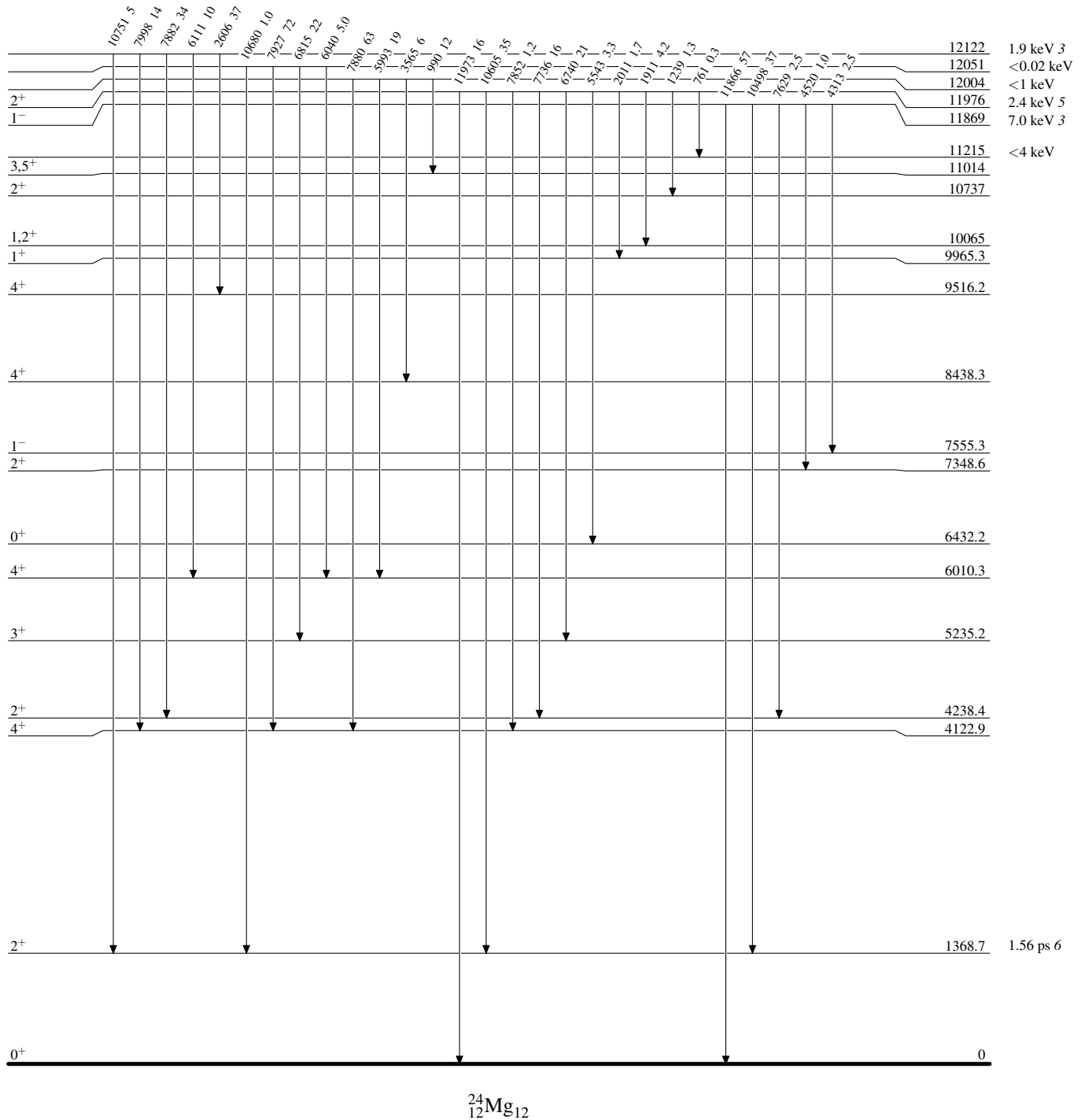
Intensities: % photon branching from each level



$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08

Level Scheme (continued)

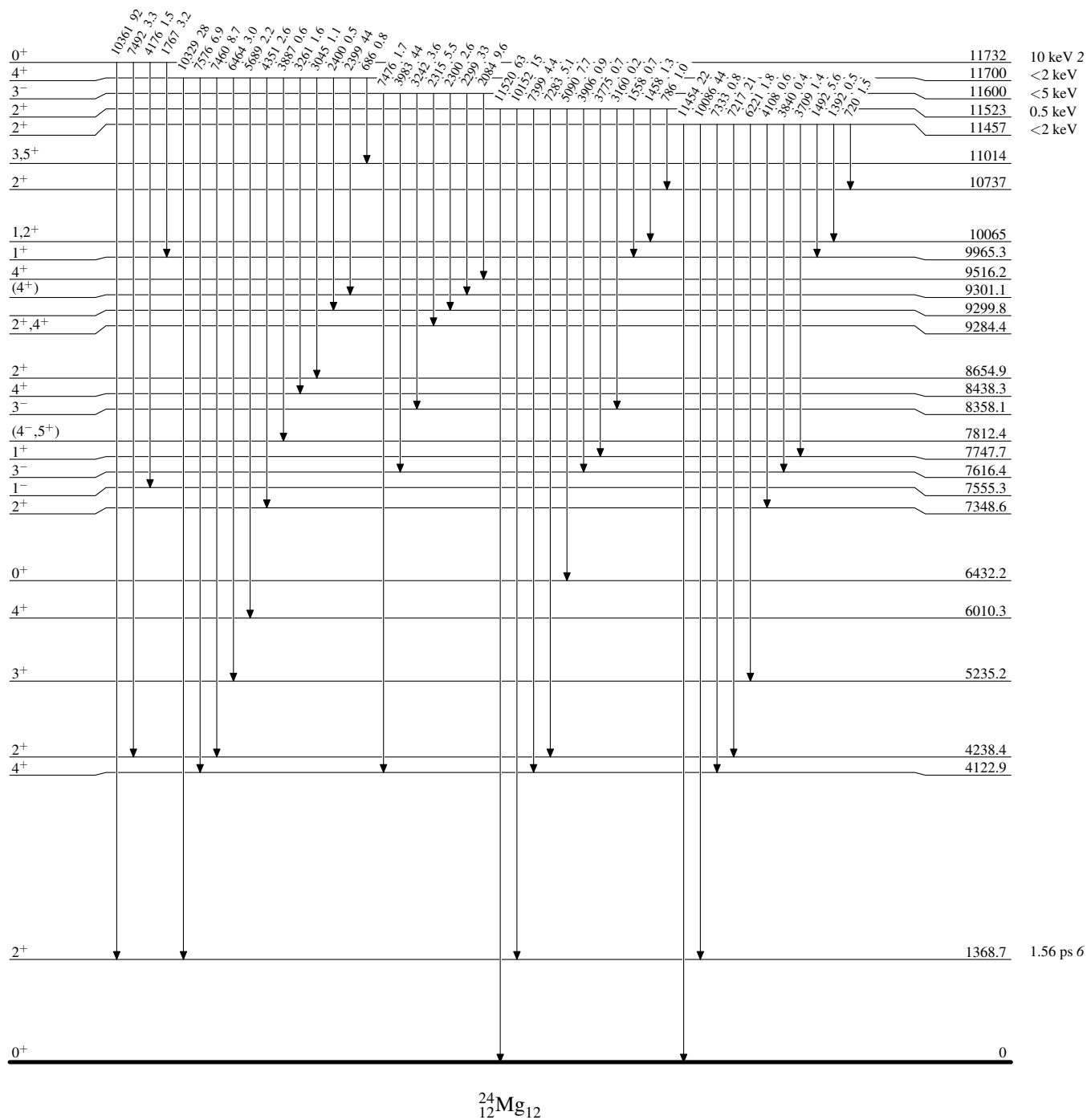
Intensities: % photon branching from each level

 $^{24}_{12}\text{Mg}_{12}$

$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08

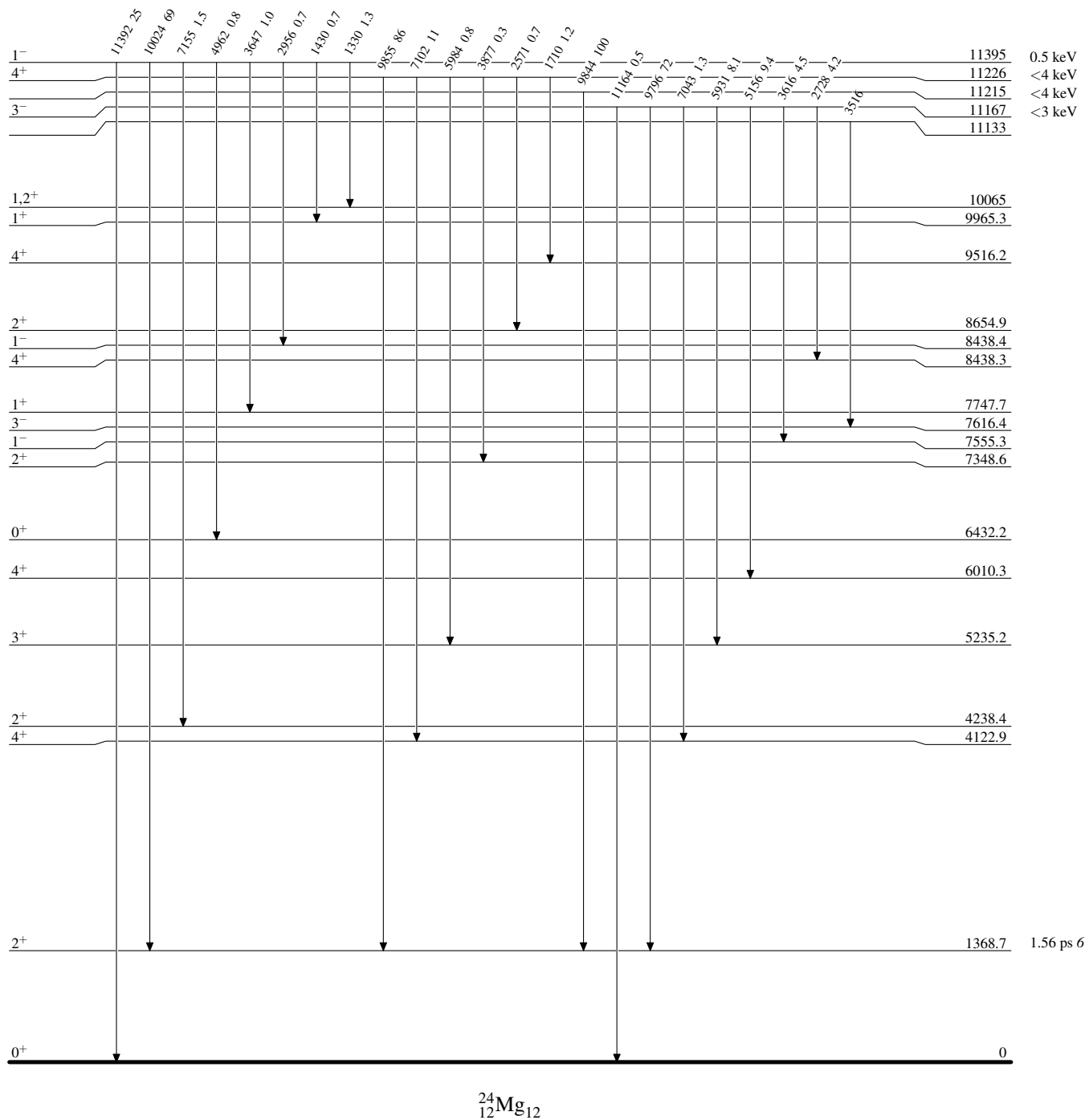
Level Scheme (continued)

Intensities: % photon branching from each level



$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08Level Scheme (continued)

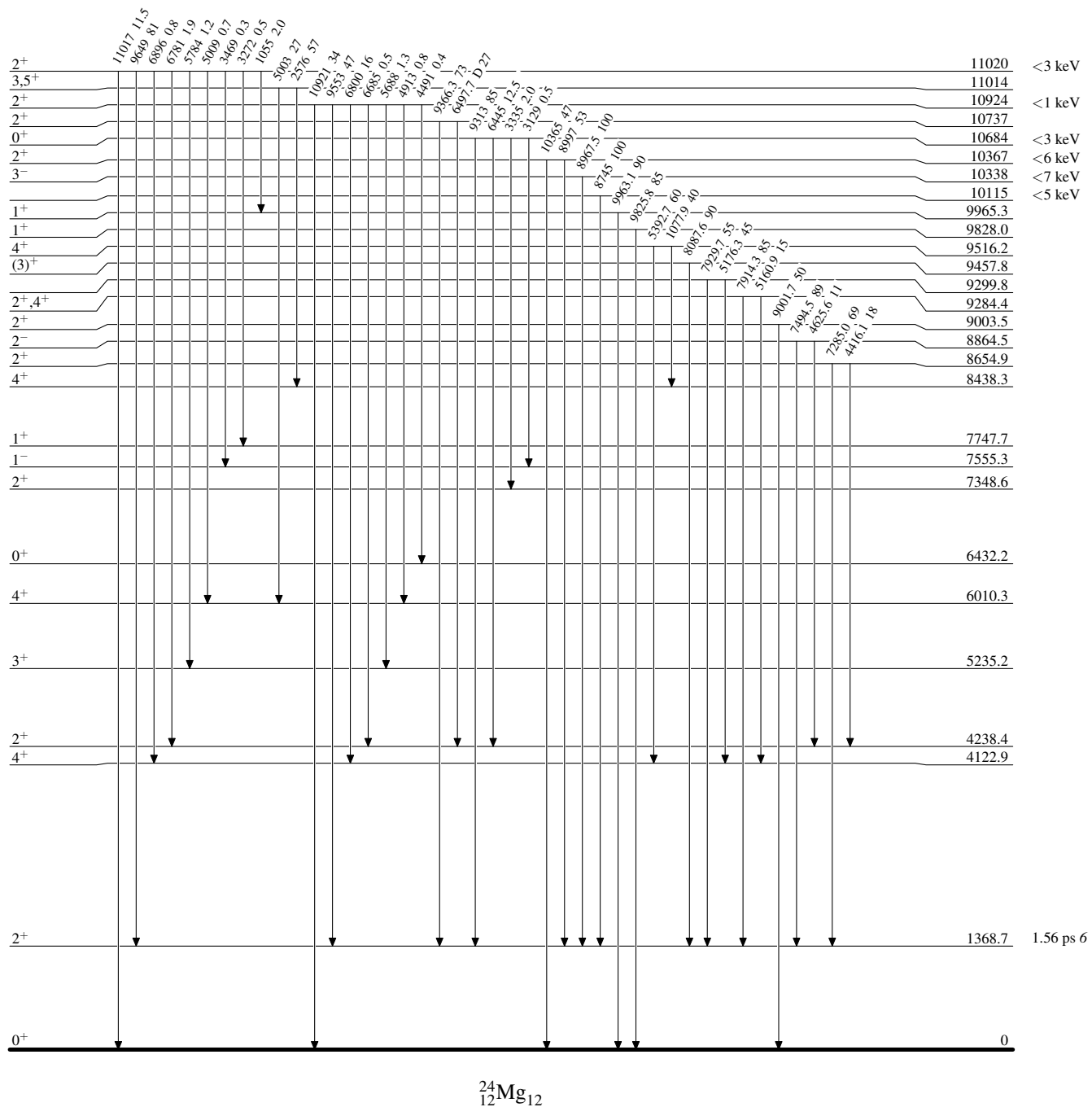
Intensities: % photon branching from each level



$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08

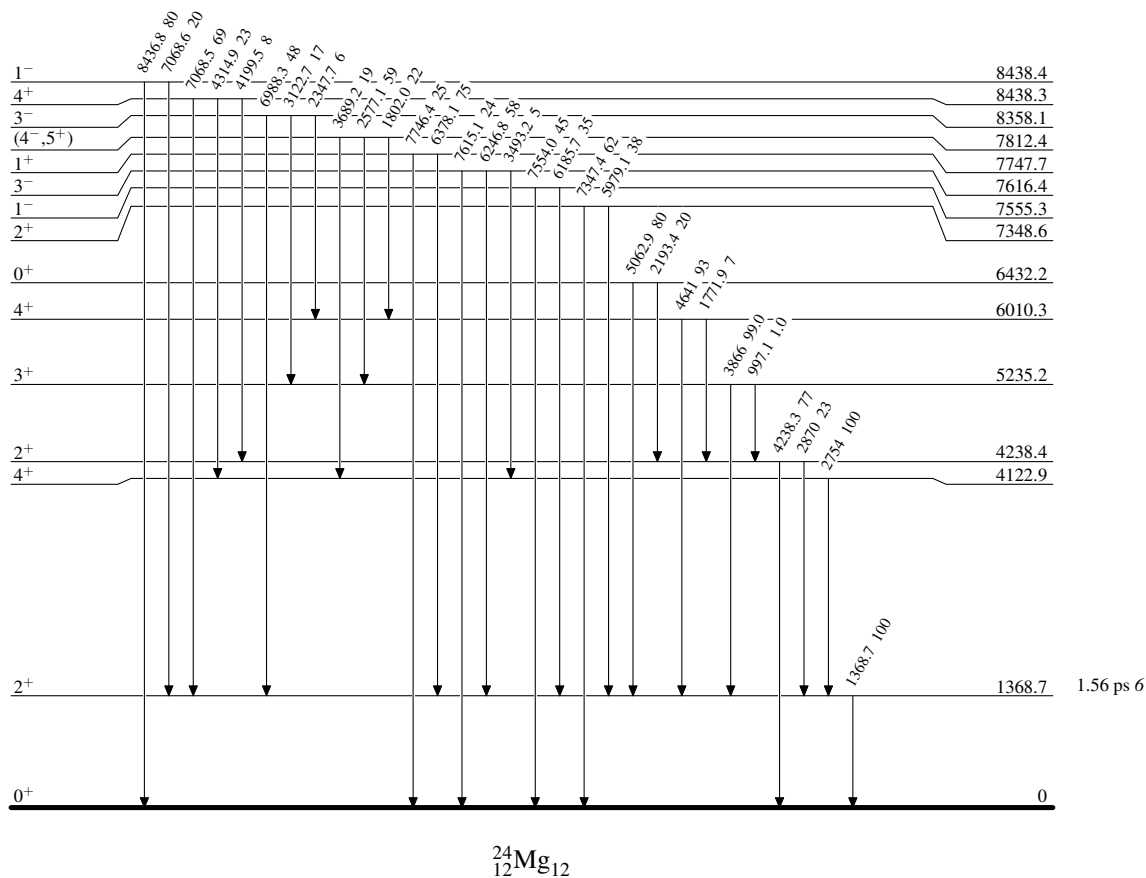
Level Scheme (continued)

Intensities: % photon branching from each level



$^{20}\text{Ne}(\alpha,\gamma)$:Resonances 1983Sc17,1978Fi08Level Scheme (continued)

Intensities: % photon branching from each level

 $^{24}_{12}\text{Mg}_{12}$