Target isotope: $^{58}_{28}$Ni $I^{\pi}_{\circ} = 0^{+}$ Abundance: 68.077(9) % $S_{\rm p} = 3417.50(87)$ keV

$^{59}_{29}$Cu(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	$\Gamma_{\rm p}$ [eV]	$\gamma^2_{\rm p}$ [keV]	Γ [eV]	$\Gamma_{\rm p}/\Gamma$	$S_{{\rm p}\gamma}$ [eV]	Γ_γ [eV]	$E_{\rm cm}$ [keV]	E^* [keV]	Ref.
855							0.002		841	4258(8)	60Ca12 57Bu64
949	⟨1⁻⟩						0.035		933	4350(8)	60Ca12 85Di05 75Tr05
1010							0.002		993	4410(8)	60Ca12 57Bu64
1098							0.014		1079	4497(8)	60Ca12 85Di05 57Bu64
1224							0.014		1203	4621(8)	60Ca12 85Di05 57Bu64
1307	⟨3⟩						0.037		1285	4702(8)	60Ca12 85Di05 57Bu64
1314							0.027		1292	4709(8)	60Ca12 85Di05 57Bu64
1378	3⁻						0.065		1355	4772(8)	60Ca12 85Di05 75Tr05
1423.6(4)	3⁻						0.62		1400.0	4818(1)	63Bo07 85Di05 75Tr05
1522							0.004		1496	4914(8)	60Ca12 57Bu64
1540							0.008		1514	4931(8)	60Ca12 57Bu64
1582							0.027		1555	4973(8)	60Ca12 57Bu64
1653							0.019		1625	5042(8)	60Ca12 57Bu64
1665	⟨3,5⟩						0.065		1637	5054(8)	60Ca12 85Di05 57Bu64
1717	3⁻						0.15	0.12	1688	5105(8)	60Ca12 85Di05 80Ho31
1833	⟨9⁺⟩		0.0054(4)		0.038(9)		0.046(5)	0.033(9)	1802	5219(8)	77Co03 75Tr05 57Bu64
1843.5(6)	1⁻		40(10)	33.4			1.00		1812.5	5230(1)	63Bo07 85Di05 70Br33
1881	3⁻						0.12	0.12	1849	5267(8)	60Ca12 85Di05 75Tr05
1907							0.03		1875	5292(8)	60Ca12
1924	⟨3,1⟩						0.12	0.05	1891	5309(8)	60Ca12 85Di05 75Tr05
1980							0.03		1946	5364(8)	60Ca12
2021							0.03		1987	5404(8)	60Ca12
2051							0.25		2016	5434(8)	60Ca12 85Di05 75Tr05
2063	3⁻						incl	0.17	2028	5446(8)	85Di05
2094							0.16		2059	5476(8)	60Ca12 85Di05 80Ho31
2103	⟨3⟩						incl	0.12	2067	5485(8)	85Di05
2143	5⁺						0.40	0.36	2107	5524(8)	60Ca12 85Di05 80Ho31
2164	5⁻						0.25		2127	5545(8)	60Ca12 85Di05 80Ho31
2172	⟨3,5⟩								2135	5553(8)	85Di05
2207	[3⁻]								2170	5587(8)	85Di05 83Si06
2212	1⁺		275(55)	19.1			0.22		2175	5592(8)	60Ca12 85Di05 76Bi0A
2225	3⁻						0.20		2187	5605(8)	60Ca12 85Di05 75Tr05
2231	3⁻						0.19		2193	5611(8)	60Ca12 85Di05 75Tr05
2244	5⁻						0.26		2206	5623(8)	60Ca12 85Di05 80Ho31
2266	3⁻,5⁻						0.48		2228	5645(8)	83Si06 85Di05 75Tr05
2282	5								2243	5661(8)	85Di05
2319							0.12		2280	5697(8)	60Ca12 85Di05
2337	⟨5⁻⟩						0.32		2297	5715(8)	60Ca12 85Di05 80Ho31
2344	3⁻						0.60		2304	5722(8)	60Ca12 85Di05 80Ho31
2428							0.07		2387	5804(8)	60Ca12 85Di05
2449							0.08		2407	5825(8)	60Ca12 85Di05
2460							0.09		2418	5836(8)	60Ca12 85Di05
2471(8)	5⁺		40(10)	11.9					2429	5847(8)	76Bi0A 70Br33
2478(8)	⟨1⁻⟩		25(5)	1.62			0.25		2436	5854(8)	60Ca12 85Di05 76Bi0A
2509	3⁻						0.35		2466	5884(8)	60Ca12 85Di05 80Ho31

(continued) $^{59}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	Γ_p/Γ	$S_{p\gamma}$ [eV]	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$\gamma_{p'}^2$ [keV]	E_{cm} [keV]	E^* [keV]	Ref.		
2525	$7^+,5^-$							0.16				2482	5900(8)	83Si06	85Di05	80Ho31
2543	5							0.22				2500	5917(8)	60Ca12	85Di05	83Si06
2557	$\langle 3^- \rangle$							0.29				2514	5931(8)	60Ca12	85Di05	80Ho31
2570	3,5							0.20				2526	5944(8)	60Ca12	85Di05	83Si06
2586								0.07				2542	5960(8)	60Ca12	85Di05	
2598												2554	5971(8)	85Di05		
2601	5							0.30				2557	5974(8)	60Ca12	85Di05	83Si06
2664	3^-							0.50				2619	6036(8)	83Si06	85Di05	80Ho31
2670(8)	3^+		30(5)	4.69				0.13				2625	6042(8)	76Bi0A	85Di05	70Br33
2708								0.21				2662	6080(8)	60Ca12	85Di05	76Bi0A
2723(8)	$1^+,3^-$		160(30)	2.41				0.32				2677	6094(8)	60Ca12	85Di05	76Bi0A
2740(8)	5^+		40(10)	5.07				0.12				2694	6111(8)	60Ca12	76Bi0A	70Br33
2757	$3^-,5^-$							0.16				2710	6128(8)	60Ca12	85Di05	83Si06
2784								0.70				2737	6154(8)	60Ca12		
2831(8)	5^+		20(5)	1.97				0.14				2783	6201(8)	60Ca12	70Br33	85Di05
2831	3^-							0.03				2787	6204(8)	85Di05	84SiZT	79Kr20
2839	9^+							0.68	0.063			2791	6208(8)	60Ca12	82Sz01	85Di05
2851								0.17				2803	6220(8)	60Ca12		
2872(8)	$1^-,3^-$		80(15)	1.74				0.32				2823	6241(8)	83Si06	85Di05	76Bi0A
2896								0.30				2847	6264(8)	60Ca12		
2918								0.13				2869	6286(8)	60Ca12	76Bi0A	70Br33
2938(8)	3^-		50(10)	0.93				1.02				2885	6303(8)	60Ca12	80Ho31	84SiZT
2958(8)	$5^+,3^-$		20(5)	1.40				0.82				2908	6325(8)	85Di05	70Br33	60Ca12
2962(8)	$\langle 5^+ \rangle$		20(5)	1.39								2912	6329(8)	85Di05	70Br33	60Ca12
2976	$3^-,5^-$							0.72				2926	6343(8)	83Si06	85Di05	80Ho31
2999(8)	$3^+,3^-$		60(10)	3.8				0.43				2948	6366(8)	83Si06	85Di05	76Bi0A
3018								0.20				2967	6384(8)	60Ca12	85Di05	
3032	$\langle 5^- \rangle$							0.22				2981	6398(8)	60Ca12	85Di05	80Ho31
3041												2989	6407(8)	85Di05		
3047								0.19				2995	6413(8)	60Ca12	85Di05	
3054(8)	3^-		90(20)	1.3				0.42				3002	6420(8)	60Ca12	85Di05	76Bi0A
3062	3^-							0.42				3010	6428(8)	60Ca12	80Ho31	83Si06
3081	$\langle 3^+ \rangle$							0.22				3029	6446(8)	60Ca12	85Di05	80Ho31
3095	5^-							0.42				3043	6460(8)	60Ca12	85Di05	80Ho31
3099	3^-							0.82				3046	6464(8)	60Ca12	85Di05	80Ho31
3108	$3^-,5^-$							0.62				3055	6473(8)	60Ca12	85Di05	83Si06
3119								0.33				3066	6484(8)	60Ca12	85Di05	
3125												3072	6490(8)	85Di05		
3131(8)	5^+		60(10)	2.71				0.25				3078	6495(8)	76Bi0A	76Ar01	70Br33
3134												3081	6498	84SiZT		
3140	7^-							1.00				3087	6504(8)	60Ca12	85Di05	
3147(8)	$\langle 1^- \rangle$		200(40)	2.33								3094	6511(8)	76Ar01	70Br33	76FlZY
3151(8)	1^+		5600(120)	33.0								3098	6515(8)	85Di05	76Bi0A	76Ar01
3151	3^+		80(16)	3.50				0.35				3098	6515(8)	76Ar01		
3166(8)	3^-		110(20)	1.23				0.41				3112	6530(8)	60Ca12	85Di05	76FlZY

(continued) $^{59}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ_p/Γ	$S_{p\gamma}$ [eV]	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$\gamma_{p'}^2$ [keV]	$\Gamma_{p'}$ [eV]	$\gamma_{p'}^2$ [keV]	E_{cm} [keV]	E^* [keV]	Ref.		
3167(8)	3^-		60(10)	0.67								3113	6531(8)	60Ca12	85Di05	76Bi0A
3171						0.25						3117	6535(8)	60Ca12	85Di05	
3181						0.25						3127	6545(8)	60Ca12	85Di05	
3191						0.08						3137	6554(8)	60Ca12	85Di05	
3199						0.19						3145	6562(8)	60Ca12	85Di05	
3212	1^-		100(20)	1.02		0.56						3158	6575(8)	60Ca12	85Di05	76Ar01
3220						0.25						3165	6583(8)	60Ca12	85Di05	
3231						0.33						3176	6594(8)	60Ca12	85Di05	
3237						0.29						3182	6600(8)	60Ca12	85Di05	
3244	1^-		100(20)	0.96								3189	6607(8)	76Ar01	85Di05	76FlZY
3255	⟨3⟩					0.63						3200	6617(8)	60Ca12	85Di05	80Ho31
3261												3206	6623(8)	85Di05		
3267	3^+		25(10)	0.49								3212	6629(8)	76Ar01	85Di05	76FlZY
3282	3^-		60(12)	0.53		0.73						3226	6644(8)	60Ca12	85Di05	76Ar01
3283	3^-		60(12)	0.53		0.21						3227	6645(8)	60Ca12	85Di05	76Ar01
3303						0.54						3247	6665(8)	60Ca12	85Di05	
3309						0.25						3253	6670(8)	60Ca12	85Di05	
3334						0.20						3277	6695(8)	60Ca12	85Di05	
3344	1^-		80(8)	0.62		0.12						3287	6705(8)	60Ca12	85Di05	76FlZY
3352	1^-		162(32)	1.26		0.96						3295	6713(8)	60Ca12	85Di05	76Ar01
3366	1^-		63(12)	0.48								3309	6726(8)	76Ar01	76FlZY	
3369	5^+		150(30)	4.09								3312	6729(8)	76Ar01	85Di05	76FlZY
3379	5^-					1.75						3322	6739(8)	79Kr20	85Di05	80Ho31
3385												3328	6745	84SiZT		
3388	1^+		2400(480)	9.31		1.22						3331	6748(8)	60Ca12	76Ar01	76FlZY
3391	1^+		30(10)	0.12								3334	6751(8)	76Ar01		
3388.5	5^+		120(40)	3.05				20(10)	5.0			3334	6751(8)	85Di05	76FlZY	
3400.3	3^-		50(5)	0.35		0.50						3344	6762(8)	76FlZY	60Ca12	85Di05
3410						0.26						3352	6770(8)	60Ca12	85Di05	
3425						0.38						3367	6784(8)	60Ca12	85Di05	
3440						0.15						3382	6799(8)	60Ca12	85Di05	
3453	3^-		50(10)	0.33		1.55						3393	6811(8)	79Kr20	85Di05	84SiZT
3475.0	9^+		11.2(4)	13.8	0.86	0.68	0.10	1(1)	1.9			3414	6832(8)	60Ca12	76Ar01	76FlZY
3476	1^-		47.6(43)	0.30		0.42						3417	6835(8)	60Ca12	85Di05	76Ar01
3481.7	5^+		114.1(30)	2.46		0.86						3421	6839(8)	60Ca12	85Di05	76Ar01
3487												3428	6845(8)	75Kl06	85Di05	
3494						1.02						3435	6852(8)	60Ca12	80Ho31	
3506	1^-		60(12)	0.36		0.55		1(1)	0.3	4(2)	1.3	3446	6863(8)	76FlZY	60Ca12	85Di05
3517	5^+		69.0(30)	1.38								3457	6875(8)	76Ar01	76FlZY	
3524	1^+		1544(180)	4.83								3464	6882(8)	76Ar01	76FlZY	
3524	⟨5⟩											3464	6882(8)	85Di05		
3530						0.42						3470	6888(8)	60Ca12	85Di05	75Kl06
3539						0.29						3479	6897(8)	60Ca12	85Di05	
3546.4	9^+		35.1(14)	29.1	0.70	0.47	0.46					3484	6901(5)	72Ma51	77Ho29	76Ar01
3551(5)	1^+		1700(100)									3491	6908(5)	72Ma51		

(continued)

$^{59}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	Γ_p [eV]	γ_p^2 [keV]	Γ_p/Γ	$S_{p\gamma}$ [eV]	$\Gamma_{p'}$ [eV]	$\gamma_{p'}^2$ [keV]	$\Gamma_{p'}$ [eV]	$\gamma_{p'}^2$ [keV]	E_{cm} [keV]	E^* [keV]	Ref.		
3564.4	5^+	150(30)	2.77							3502	6919(5)	76Ar01	76FlZY	
3568	1^-				3.77					3508	6925(5)	60Ca12	92Ho01	
3578	1^-	212(15)*	1.12							3517	6935(5)	76Ar01	76FlZY	
3584	1^-	80(16)*	0.42			10(4)	2.4			3523	6941(5)	76Ar01	76FlZY	
3588.9	3^+	400(80)	7.06		0.66	10(4)	1.0			3525	6943(5)	60Ca12	85Di05	76Ar01
3591	3^-	90(18)	0.46		0.93(44)					3530	6948(5)	60Ca12	85Di05	76Ar01
3608.6	5^+	75.6(25)	1.28		0.78	75(10)	7.1	3(2)	3.1	3547	6964(5)	76FlZY	60Ca12	76Ar01
3613	3^-	35.5(39)	0.18							3552	6969(5)	76Ar01	85Di05	76FlZY
3618										3557	6974(5)	85Di05		
3625					0.47					3564	6981(5)	60Ca12		
3635.0	5^+	31(10)	0.50		0.54					3571	6989(5)	76FlZY	60Ca12	85Di05
3648										3586	7004(5)	85Di05		
3657	1^+	7000(1400)	18.1		0.27					3595	7013(5)	60Ca12	85Di05	76Ar01
3672	3^-	78(15)	0.36		0.21	2(1)	0.3	7(2)	1.2	3610	7027(5)	76FlZY	60Ca12	85Di05
3687.5	5^+	18(10)	0.27		0.40	5(2)	0.4	1(1)	0.8	3624	7041(5)	76FlZY	60Ca12	85Di05
3696					0.76					3633	7051(5)	60Ca12	85Di05	
3719	3^-	100(20)	0.43		0.21	3(2)	0.4			3656	7073(5)	60Ca12	76Ar01	76FlZY
3732					0.61					3669	7086(5)	60Ca12	85Di05	
3737					0.72					3674	7091(5)	60Ca12		
3742	3^-	314.7(71)	1.30		0.52	20(5)	2.6			3679	7096(5)	60Ca12	76Ar01	76FlZY
3752**	5^+	2300(460)	24.3	0.8	10.0	105(20)	5.8	115(20)	66	3688	7106(5)	76FlZY	76Ar0A	79Kr20
3767	3^-				1.28(59)					3703	7121(5)	60Ca12	80Ho31	
3775.9	3^-	20(10)	0.08		0.44					3711	7129(5)	76FlZY	60Ca12	76Ar01
3785.7	5^+	809.3(415)	9.1	0.9						3721	7138(5)	76Ar01	76FlZY	
3783	1^-	673(32)	2.61		0.20					3719	7136(5)	60Ca12	76Ar01	76FlZY
3798.3	3^-	100(20)	0.38		0.82(72)					3733	7150(5)	76FlZY	60Ca12	85Di05
3800	5^-				0.74(59)					3736	7153(5)	60Ca12	85Di05	80Ho31
3820	1^+	5000(1000)	10.5		0.44					3755	7173(5)	60Ca12	85Di05	76Ar01
3826	1^-	500(100)	1.83		0.66(57)					3761	7179(5)	60Ca12	85Di05	76Ar01
3835.7	3^+	2000(400)	23.1		0.66(57)	90(30)	3.7	10(4)	4.2	3769	7187(5)	60Ca12	76FlZY	76Ar01
3848	1				0.36(36)					3783	7200(5)	60Ca12	85Di05	80Ho31
3851					0.58					3786	7203(5)	60Ca12		
3856	7^-	5	0.32		0.53(40)					3791	7208(5)	60Ca12	76Ar01	80Ho31
3878	1^-	626(36)	2.13		0.53					3812	7230(5)	60Ca12	76Ar01	76FlZY
3883					0.18					3817	7235(5)	60Ca12		
3891.0	5^+	40(10)	0.42		0.18					3824	7242(5)	76FlZY	60Ca12	76Ar01
3891.4	3^-	55(10)	0.18			2(1)	0.2	6(2)	0.5	3825	7242	76FlZY		
3896	1^-	70(15)	0.23							3829	7247	76FlZY		
3903	5^-				0.6(4)					3837	7254(5)	60Ca12	80Ho31	
3911	5^-				0.7(4)					3845	7262(5)	60Ca12	80Ho31	
3914.7	3^+	1800(360)	12.5	0.68	13.0	460(100)	15	95(25)	30	3845	7262(5)	76FlZY	76Ar01	79Kr20
3919	3^-				0.7(2)					3853	7270(5)	60Ca12	80Ho31	
3931	3^-	60.2(44)	0.19							3864	7282(5)	76Ar01	85Di05	
3936.2	3^-	151.2(72)	0.48		0.40	130(20)	0.4			3867	7285(5)	76FlZY	60Ca12	76Ar01
3938**	5^+	300(60)	2.96			10(3)	0.3	10(3)	2.9	3866	7284(5)	76FlZY	76Ar01	

(continued) $^{59}_{29}\mathbf{Cu}(\mathrm{p})$

$E_\circ$ [keV]	$2J^\pi$	Γ_p [eV]	γ^2_p [keV]	Γ_p/Γ	$S_{\mathrm{p}\gamma}$ [eV]	$\Gamma_{\mathrm{p}'}$ [eV]	$\gamma^2_{\mathrm{p}'}$ [keV]	$\Gamma_{\mathrm{p}'}$ [eV]	$\gamma^2_{\mathrm{p}'}$ [keV]	E_cm [keV]	E^* [keV]	Ref.
3939.9	3^-	450(45)	1.30			2(1)	0.1	9(2)	0.6	3873	7290	76FlZY
3952	3^-				1.5(9)					3885	7303(5)	60Ca12 85Di05 80Ho31
3965	1^+	1600(320)	2.55	0.90						3898	7315(5)	76Ar01 76FlZY
3982	3^+	100(20)	0.92							3915	7332(5)	76Ar01
3983	1^+	11500(230)	20.0							3915	7333(5)	76Ar01 76FlZY
3985	5^-				1.08					3917	7335(5)	60Ca12 85Di05 80Ho31
3988**	5^+	200(40)	1.76			10(4)	0.3	6(3)	1.5	3920	7337	76FlZY
4000	1^-	80.9(97)	0.24							3932	7350(5)	76Ar01
4000	5^-	15(4)	0.70		1.0	2(1)	0.1	5(3)	0.3	3934	7352(5)	76FlZY 60Ca12 85Di05
4006.4	3^-	145(20)	0.41			2(1)	0.1	7(3)	0.4	3938	7355	76FlZY
4015.7	5^-	31(10)	1.40		0.8	2(1)	0.1			3947	7364(5)	76FlZY 60Ca12
4022.4	3^-	2500(200)	6.96							3961	7378(5)	76FlZY 80Ho31
4034**	5^+	2000(300)	16.4			80(20)	1.8	60(15)	13	3965	7383	76FlZY
4043.1	3^-	75(8)	0.20		1.2					3964	7381(5)	76FlZY 60Ca12 85Di05
4049.2	3^+	1000(150)	8.04		1.42	260(50)	5.6	20(10)	4.0	3979	7397(5)	76FlZY 60Ca12 85Di05
4052.1	1^+	235(25)	0.37							3983	7400	76FlZY
4064.3	1^-	140(30)	0.37		0.45	75(20)	3.3			3993	7411(5)	76FlZY 60Ca12 85Di05
4066					0.27					3997	7415(5)	60Ca12
4078					0.58					4009	7426(5)	60Ca12 85Di05
4086**	5^+	500(50)	3.81		0.54	80(20)	3.5	20(8)	3.5	4017	7434(5)	76FlZY 60Ca12
4090.2	3^+	1800(180)	16.6		0.72	40(10)	0.8			4023	7440(5)	76FlZY 60Ca12
4099					1.08					4030	7447(5)	60Ca12
4108.3	5^-	9(2)	0.35			1(1)	0.1			4038	7456	76FlZY
4113.1	3^+	40(15)	0.29		0.72	5(4)	0.1	15(6)	2.4	4047	7465(5)	76FlZY 60Ca12
4122.0	3^+	100(15)	0.72			160(20)	2.8			4052	7469	76FlZY
4125.3	3^-	30(10)	0.07			10(4)	0.4			4055	7472	76FlZY
4126.6	1^-	3800(380)	9.33		0.27					4059	7477(5)	76FlZY 60Ca12 85Di05
4140.5	5^-	8(4)	0.29			3(1)	0.1	3(1)	0.1	4070	7487	76FlZY
4144.2	1^-	900(90)	2.17		0.77	400(80)	14			4066	7483(5)	76FlZY 60Ca12 85Di05
4148.5	1^+	25(15)	0.04							4078	7495	76FlZY
4155.0	3^-	60(10)	0.14			7(3)	0.2	20(4)	0.7	4084	7502	76FlZY
4159**	5^+	750(75)	5.16		0.59	150(40)	2.4	100(20)	14	4089	7506(5)	60Ca12 85Di05
4164.3	3^+	900(100)	6.15		0.54	440(100)	6.9	180(40)	25	4093	7511(5)	76FlZY 60Ca12
4164.9	5^-	45(10)	1.58			10(10)	0.3			4094	7511	76FlZY
4172.3	5^-	40(10)	1.38		0.68	17(5)	0.6			4102	7520(5)	76FlZY 60Ca12 85Di05
4178.0	5^-	32(10)	1.10			17(5)	0.5			4107	7524	76FlZY
4178.8	1^+	2300(500)	3.22		0.63					4109	7527(5)	76FlZY 60Ca12 85Di05
4180.6	3^+	1100(200)	7.34			660(200)	10	90(20)	12	4109	7527	76FlZY
4181.6	3^-	28(10)	0.06							4110	7528	76FlZY
4189.4	3^-	350(40)	0.80		1.04	20(6)	0.6			4125	7542(5)	60Ca12 85Di05
4201					0.50					4130	7547(5)	60Ca12
4214					0.28					4143	7560(5)	60Ca12
4228					0.50					4156	7574(5)	60Ca12
4244					0.68					4172	7590(5)	60Ca12 85Di05
4248					0.46					4176	7594(5)	60Ca12

(continued) $^{59}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	Γ_p/Γ	$S_{p\gamma}$ [eV]	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	E_{cm} [keV]	E^* [keV]	Ref.
4259								0.64			4187	7604(5)	60Ca12
4265								0.55			4193	7610(5)	60Ca12 85Di05
4275								0.73			4203	7620(5)	60Ca12 85Di05
4282								0.28			4209	7627(5)	60Ca12 85Di05
4288								0.55			4215	7633(5)	60Ca12
4291								0.37			4218	7636(5)	60Ca12
4298								1.55			4225	7643(5)	60Ca12
4309	5							0.73			4236	7653(5)	60Ca12 85Di05
4330											4257	7674(5)	85Di05
4340											4266	7684(5)	85Di05
4357	⟨5⟩										4283	7701(5)	85Di05
4392											4318	7735(5)	85Di05
4413											4338	7756(5)	85Di05
4422.0(50)	1^+		800(400)		<3000						4347	7765(5)	85Di05 84Ge02
4428.0(50)	$3^+,5^+$		700(350)		<2500						4353	7770(5)	84Ge02
4434											4359	7776(5)	85Di05
4443.8(50)	1^+		2100(1000)		<3800						4368	7786(5)	84Ge02
4456.0(50)	1^+		1600(800)		<4300						4380	7798(5)	85Di05 84Ge02
4460.2(50)	1^+		1200(600)		<2500						4385	7802(5)	85Di05 84Ge02
4486											4410	7827(5)	85Di05
4505											4429	7846(5)	85Di05
4515.7(50)	1^+		2800(1400)		<4800						4439	7857(5)	84Ge02
4525											4448	7866(5)	85Di05
4539											4462	7880(5)	85Di05
4554.5(50)	1^+		8700(4300)		<11100						4477	7895(5)	85Di05 84Ge02
4560											4483	7900(5)	85Di05
4565.6(50)	$3^+,5^+$		2000(1000)		<8200						4488	7906(5)	85Di05 84Ge02
4585											4507	7925(5)	85Di05
4603.3(50)	1^+		4100(2000)		<7800						4525	7943(5)	84Ge02
4606.5(50)	1^+		400(200)		<1200						4528	7946(5)	84Ge02
4610.3(50)	$3^+,5^+$		1300(650)		<10400						4532	7950(5)	85Di05 84Ge02
4628											4550	7967(5)	85Di05
4637.0(50)	1^+		1500(750)		<9000						4558	7976(5)	84Ge02
4654.1(50)	$3^+,5^+$		1500(750)		<8000						4575	7993(5)	85Di05 84Ge02
4674.8(50)	3^-		1100(550)		<3900						4596	8013(5)	85Di05 84Ge02
4678.3(50)	1^+		1700(850)		<6400						4599	8016(5)	84Ge02
4689.6(50)	$3^+,5^+$		200(100)		<400						4610	8028(5)	85Di05 84Ge02
4703.0(50)	$3^+,5^+$		200(100)		<2000						4623	8041(5)	85Di05 84Ge02
4706.0(50)	$1^-,3^-$		400(200)		<3000						4626	8044(5)	84Ge02
4716.0(50)	$1^-,3^-$		400(200)		<3000						4636	8054(5)	84Ge02
4721											4641	8058(5)	85Di05
4732											4652	8069(5)	85Di05
4743.5(50)	5^+		2500(500)		3000		0.83				4663	8081(5)	85Di05 78Be32 84Ge02
4748.0(50)	1^+		700(140)		2000		0.35				4668	8085(5)	85Di05 78Be32
4762											4681	8099(5)	85Di05

(continued) $^{59}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	Γ_p/Γ	$S_{p\gamma}$ [eV]	Γ_γ [eV]	E_{cm} [keV]	E^* [keV]	Ref.
4773.0(50)	5^+		400(80)		800		0.50			4692	8110(5)	85Di05 78Be32 84Ge02
4775.0(50)	1^-,3^-		500(100)		<9000					4694	8112(5)	84Ge02
4792.0(50)	1^+		9000(1800)		9000		1.00			4711	8128(5)	78Be32 84Ge02
4797.5(50)	5^+		500(100)		800		0.63			4716	8134(5)	85Di05 78Be32 84Ge02
4803.0(50)	1^+		400(80)		1000		0.40			4722	8139(5)	85Di05 78Be32 84Ge02
4807.0(50)	3^+,5^+		200(40)		<1500					4726	8143(5)	84Ge02
4812.0(50)	1^-,3^-		500(100)		<8000					4730	8148(5)	84Ge02
4847.1(50)	3^+,5^+				<37500					4765	8182(5)	84Ge02
4853.0(50)	5^+		3800(760)		4000		0.95			4771	8188(5)	85Di05 78Be32 84Ge02
4856.0(50)	1^+		1300(260)		2000		0.65			4774	8191(5)	78Be32
4858.5(50)	1^+		800(160)		1000		0.80			4776	8194(5)	78Be32
4863.9(50)	1^+		2000(400)		3000		0.67			4782	8199(5)	78Be32
4867.0(50)	5^+		2000(400)		2000		1.00			4785	8202(5)	85Di05 78Be32 84Ge02
4873.1(50)	3^+,5^+		1600(320)		<3400					4791	8208(5)	84Ge02
4892.0(50)	5^+		500(100)		<3000					4809	8227(5)	85Di05 84Ge02
4904.5(50)	1^+		3000(600)		4000		0.75			4821	8239(5)	85Di05 78Be32 84Ge02
4907.0(50)	5^+		3500(700)		4000		0.88			4824	8241(5)	84Ge02 78Be32
4918.0(50)	1^+		2000(400)		3000		0.67			4835	8252(5)	85Di05 78Be32 84Ge02
4924.0(50)	1^+		6000(1200)		9000		0.67			4841	8258(5)	78Be32
4927.0(50)	5^+		800(160)		4000		0.20			4843	8261(5)	85Di05 78Be32
4933.0(50)	5^+		2000(400)		6000		0.33			4849	8267(5)	85Di05 78Be32 84Ge02
4942.0(50)	3^+,5^+		1100(220)		<7200					4858	8276(5)	84Ge02
4944.0(50)	1^-		2500(500)		4000		0.63			4860	8278(5)	85Di05 78Be32
4947.0(50)	1^+		600(120)		<2800					4863	8281(5)	84Ge02
4951.6(50)	1^+		300(60)		<1600					4868	8285(5)	84Ge02
4952.0(50)	1^-		1000(200)		2000		0.50			4868	8286(5)	85Di05 78Be32
4956.0(50)	5^+		800(160)		1500		0.53			4872	8290(5)	84Ge02 78Be32
4982.5(50)	1^-		2000(400)		2000		1.00			4898	8316(5)	84Ge02 78Be32
5000.0(50)	3^+,5^+		3200(1600)		22600					4915	8333(5)	85Di05 84Ge02
5019.0(50)	1^-,3^-		2300(1200)		<5700					4934	8351(5)	84Ge02
5034.9(50)	1^+		200(100)		<500					4950	8367(5)	84Ge02
5044.1(50)	3^+,5^+		1800(900)		<5400					4959	8376(5)	84Ge02
5065.9(50)	1^-,3^-		1600(800)		<5900					4980	8397(5)	84Ge02
5068.6(50)	1^+		500(250)		<1800					4983	8400(5)	84Ge02
5104.0(50)	1^+		300(150)		<4000					5017	8435(5)	84Ge02
5116.0(50)	1^+		200(100)		<1400					5029	8447(5)	84Ge02
5121.5(50)	1^-,3^-		800(400)		<3100					5035	8452(5)	84Ge02
5129.0(50)	3^+,5^+		2800(1400)		<9600					5042	8460(5)	84Ge02
5175.0(50)	3^+,5^+		700(350)		<4000					5087	8505(5)	84Ge02
5186.0(50)	3^+,5^+		1800(900)		<12000					5098	8516(5)	84Ge02
5196.0(50)	1^+		600(300)		<3600					5108	8525(5)	84Ge02
5211.0(50)	1^-,3^-		1800(900)		<9000					5123	8540(5)	84Ge02
5235.0(50)	3^+,5^+		1700(850)		<5900					5146	8564(5)	84Ge02
5266.8(50)	1^+		10300(5000)		<14700					5178	8595(5)	84Ge02
5286.5(50)	1^+		300(150)		<900					5197	8614(5)	84Ge02

(continued) $^{59}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	Γ_p/Γ	$S_{p\gamma}$ [eV]	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$\gamma_{p'}^2$ [keV]	$\Gamma_{p'}$ [eV]	E_{cm} [keV]	E^* [keV]	Ref.
5321.0(50)	1^+		2100(1100)		<9800								5231	8648(5)	84Ge02
5329.4(50)	1^+		800(400)		<3700								5239	8657(5)	84Ge02
5340.0(50)	$3^+,5^+$		1100(550)		<5200								5249	8667(5)	84Ge02
5352.0(50)	1^-3^-		4300(2100)		<8800								5261	8679(5)	84Ge02
5364.5(50)	1^+		4900(2500)		<5900								5274	8691(5)	84Ge02
5376.0(50)	$3^+,5^+$		2500(1200)		<10000								5285	8702(5)	84Ge02
5396.5(50)	1^+		4200(2100)		<6800								5305	8722(5)	84Ge02
5406.5(50)	$3^+,5^+$		2000(1000)		<6800								5315	8732(5)	84Ge02
5420.0(50)	$3^+,5^+$		400(200)		<2900								5328	8746(5)	84Ge02
5439.0(50)	1^+		2600(1300)		<13900								5347	8764(5)	84Ge02
5446.2(50)	1^+		1300(650)		<4700								5354	8771(5)	84Ge02
5507.2(50)	1^+		12500(6200)		<17300								5414	8831(5)	84Ge02
5518.1(50)	$1^-,3^-$		4300(2150)		<5800								5425	8842(5)	84Ge02
5538.3(50)	1^+		7100(3500)		<7100								5444	8862(5)	84Ge02
5559.9(50)	$3^+,5^+$		1400(700)		<4100								5466	8883(5)	84Ge02
5564.9(50)	$3^+,5^+$		1100(550)		<5700								5471	8888(5)	84Ge02
5576.0(50)	1^+		15500(7500)		<25.0								5481	8899(5)	84Ge02
5596.0(50)	1^+		1500(750)		<6000								5501	8919(5)	84Ge02
5610.0(50)	$1^-,3^-$		2000(1000)		<6000								5515	8932(5)	84Ge02
5618.0(50)	$3^+,5^+$		400(200)		<13700								5523	8940(5)	84Ge02
5626.0(50)	1^+		400(200)		<6100								5531	8948(5)	84Ge02
5632.0(50)	$3^+,5^+$		400(200)		<4000								5537	8954(5)	84Ge02
5638.0(50)	$1^-,3^-$		700(350)		<2800								5542	8960(5)	84Ge02
5656.0(50)	$1^-,3^-$		1000(500)		<1100								5560	8978(5)	84Ge02
5667.7(50)	1^+		700(350)		<2500								5572	8989(5)	84Ge02
5670.6(50)	$3^+,5^+$		2500(1250)		<7600								5575	8992(5)	84Ge02
5680.3(50)	$3^+,5^+$		5600(2800)		<10400								5584	9001(5)	84Ge02
5693.0(50)	$3^+,5^+$		1000(500)		<4000								5597	9014(5)	84Ge02
5699.0(50)	1^+		200(100)		<900								5602	9020(5)	84Ge02
5708.0(50)	$3^+,5^+$		4700(2300)		<6800								5611	9029(5)	84Ge02
5722.0(50)	1^+		6100(3000)		<7700								5625	9043(5)	84Ge02
5738.5(50)	1^+		1900(950)		<6000								5641	9059(5)	84Ge02
5757.0(50)	1^+		3200(1600)		<4800								5659	9077(5)	84Ge02
5766.0(50)	$3^+,5^+$		11400(5700)		<20300								5668	9086(5)	84Ge02
5792.5(50)	1^+		10700(5300)		<11500								5694	9112(5)	84Ge02
5802.3(50)	$1^-,3^-$		300(150)		<1100								5704	9121(5)	84Ge02
5810.6(50)	$3^+,5^+$		100(50)		<800								5712	9130(5)	84Ge02
5837.5(50)	1^+		5100(2500)		<11900								5739	9156(5)	84Ge02
5852.0(50)	1^+		1000(500)		<600								5753	9170(5)	84Ge02
5870.0(50)	1^+		25000(12500)		<35000								5771	9188(5)	84Ge02
5920	5^+		30000		60000					15000			5820	9237	79El07
5980	1^-		25000		50000					6000			5879	9296	79El07

(continued) **$^{59}_{29}$Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ^2_p [keV]	Γ [eV]	Γ_p/Γ	Γ_p/Γ	$S_{p\gamma}$ [eV]	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$\gamma^2_{p'}$ [keV]	$\Gamma_{p'}$ [eV]	$\gamma^2_{p'}$ [keV]	E_{cm} [keV]	E^* [keV]	Ref.
6020	1^+		25000		50000					10000				5918	9335	79El07
6140	1^+		25000		50000					10000				6036	9453	79El07

Additional data on this isotope can be found in [93Ba85, 89Iz01, 86Iz01, 85Ti04, 84Ca02, 83Si24, 80Ch33, 78Kr09, 76Ga19, 75Co21, 75Ha10, 75Ho19, 74Be72, 72Sz01, 72Gu17, 70Fo09, 70Ho34, 63Bo07, 56Sc09].

* Different Γ_p=600(60) and 140(15) eV were obtained in [76FlZY] for these two resonances.

** For this resonance parameters of three inelastic scattering channels were reported [76FlZY].

For resonances at 4000, 4022 and 4043 keV $g\Gamma_\gamma$=0.2, 0.5 and 0.4 eV were given in [80Ho31].

Some of resonance positions were used as a secondary energy standard [68Tr04].

Uncertainies in inelastic proton widths are given in Supplement. Most of $E_\circ$ are from [60Ca12].

The shift about 4 keV in values $E_\circ$ from [76FlZY] and [76Ar01] was noticed.

No correction was made for values $E_\circ$, E_{cm}, E^*.

Levels at E^*=3905, 4301, 4307, 4349, 4770, 5231 keV and some other energies are possible fragments of analog states in ^{59}Ni with E^*=0, 339, 465, 878, 1302 keV, etc. [93Ba85].

Branching ratios of γ-transitions [85Di05]. Part 1. **$^{59}_{29}$Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^*			0	491	914	1399	1865	1988	2266	2318	2324	2587	2664	2706	2715
$2J^\pi_f$			3^-	1^-	5^-	7^-	7^-	5^+	3^+	1^-5^-	3	11^-	9^-	5^-	7^-
491.09(10)	1^-		100												
913.98(17)	5^-		100												
1398.51(11)	7^-		100												
1865.24(11)	7^-		30		55	15									
1987.80(15)	$5^{\langle+\rangle}$		100												
2266.30(19)	3^+		52	48											
2318.1(8)	1,5		83	17											
2323.85(18)	3		90		10										
2390.83(16)	$\langle 9\rangle^-$														
2587.2(3)	$11^{\langle-\rangle}$					100									
2664.40(17)	$\langle 9^-\rangle$						100								
2705.94(22)	$5^{\langle-\rangle}$			27	59	14									
2714.80(19)	$7^{\langle-\rangle}$		37		28	20		15							
2928.2(16)	$5^{\langle-\rangle}$		34	10	45			11							
2992.9(21)	$\langle 7^-\rangle$		37		58			5							
3024.8(10)	$5^{\langle-\rangle}$		45	40	15										
3042.58(12)	9^+		1		3	76	20								
3114.1(5)	5^-		72	28											
3121.6(7)															

(continued)

$^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^* $2J^\pi_\mathrm{f}$			0 3^-	491 1^-	914 5^-	1399 7^-	1865 7^-	1988 5^+	2266 3^+	2318 1^-5^-	2324 3	2587 11^-	2664 9^-	2706 5^-	2715 7^-
3129.64(15)	3^-		29	35	36										
3309.0(20)	$7^{\langle -\rangle}$														
3309	7^+–9^+		25		45	30									
3329.43(16)	$\langle 11^- \rangle$														
3434(4)	5		30		70										
3437	7^+,9^+														
3438(4)	$\langle 1 \rangle$		100												
3447.68(18)	$\langle 13 \rangle^-$														
3550.6(12)	5^-		35		65										
3573.9(8)	5,7														
3578.1(6)	3–7				70	30									
3580.25(14)	5^+														
3615.0(10)	3^-		35	65											
3654(10)	1^-,3^-														
3699(4)	7^-				100										
3728.9(21)	3,5					25		35			45				
3741.8(16)	3^-				50			50							
3757.7(9)	5–9				60	40									
3885.5(21)	3^-		45					55							
3905.2(18)	3^-		50		50										
3930.0(24)	5^+														
4000(2)	$\langle 1 \rangle^-$														
4051.0(10)	1^-,3^-														
4072(3)	3–7				25			75							
4100.13(18)	$\langle 13^- \rangle$														
4108.0(10)	3^-														
4154															
4183(4)	5–9					40								60	
4207.0(18)	5,7		24		28	22					26				
4213(9)	7^+,9^+														
4258(2)															
4267(7)	1^-,3^-														
4301.3(15)	$5^{\langle -\rangle}$				40	60									
4307(4)	$5^{\langle -\rangle}$				100										
4348.9(10)	$\langle 1 \rangle^-$	949	6	16					17	9	27				
4409.9(24)															
4441.0(24)	7^+				50	50									
4465(4)	5–9				100										
4500.0(7)	$\langle 1 \rangle^-$														
4528.4(3)	$\langle 13^+ \rangle$														
4530.0(10)	$\langle 7 \rangle$				100										
4622.3(7)															

(continued) $^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^* $2J^\pi_f$			0 3^-	491 1^-	914 5^-	1399 7^-	1865 7^-	1988 5^+	2266 3^+	2318 1^-5^-	2324 3	2587 11^-	2664 9^-	2706 5^-	2715 7^-
4701.8(21)		1307	63	21							16				
4709.2(20)	1^-,3^-														
4770.1(5)	3^-	1378	3	36	19		3	11	8	7				2	1
4817.6(5)	3^-	1424	27	55	5			7	2		3				
4903.39(21)	$\langle 15^-\rangle$														
4914.2(21)	5–9														
4930.9(24)	7^+,9^+														
4972.2(24)	3^+,5^+														
5042.0(24)															
5053.5(9)	$\langle 5\rangle^-$	1665	30		15			36						3	7
5105.5(8)	$\langle$1–5$\rangle$														
5218.6(6)	9	1833**				92	8								
5230.7(4)	1^-	1844	86	6					6						
5255.0(10)															
5264(3)	3^-	1883**	35	18	4			1	<1	4	7			7	
5306(3)	$\langle 1\rangle^-$	1923**	9								66				
5427.8(4)	$\langle 17^+\rangle$														
5431(4)															
5443.6(9)	$\langle 3\rangle^+$	2057**	13	21	16			23	3		4			3	
5474.0(9)															
5482(4)	$\langle 5\rangle^-$	2105**		30	4	3	9	6	16		15				
5522.3(4)	5	2143	89		6	4									1
5542(3)	1^-–5^-														
5550.0(6)	3,5	2172	37				23		17						
5584(4)															
5589(4)															
5595(3)	$\langle 1^+\rangle$														
5600.8(7)	$\langle 3\rangle$	2225	50	13	3				11	10					
5608(4)	$\langle 1\rangle^-$														
5620(4)	$7^{\langle -\rangle}$	2238**	47				2	4					19	11	2
5645.0(8)	3^-,5^-	2266	30	12	18	4	2	2	10	7	3				
5657(4)	5	2282			13	43	3	3	8	3					12
5694(4)															
5711(4)	$5/2^-$	2337	56		7	10			7						4
5719(4)	$3,5^-$	2344	13					35		15	22				
5880.7(7)	3^-,5^-	2509	70	6	3			4	13						3
5897(4)	$7^{\langle -\rangle}$	2525				88		6							
6039(4)	$3^{\langle +\rangle}$	2670	46	12	9			8	7		9				2
6076(4)	3														
6086(3)	$\langle 1^+\rangle$														
6091.8(7)	3	2723	70	15							11				
6103(3)	$\langle 5^+\rangle$														

(continued) $^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^* $2J^\pi_\mathrm{f}$			0 3^-	491 1^-	914 5^-	1399 7^-	1865 7^-	1988 5^+	2266 3^+	2318 1^-5^-	2324 3	2587 11^-	2664 9^-	2706 5^-	2715 7^-
6127.5(14)	3^-														
6197(4)	$\langle 3\rangle$	2831		39					8		23				8
6201(4)	3	2835	5	13	6			21	5		18			4	
6206(4)	9^+	2839						4				6			3
6229(3)	$\langle 1^-\rangle$														
6236.7(9)	3^-	2872	34	28		14		4	7						
6295(3)	$\langle 1^-\rangle$														
6303.9(10)	$3^{\langle -\rangle}$	2935	9	22			5	18	4	5				2	5
6310(9)	$\langle 9\rangle^+$														
6323.9(24)	$\langle 5\rangle$	2958	8	13	5	9	45		4	11					5
6326(4)	$\langle 3^-\rangle$	2962	65	5			12		12	6					
6328(3)	$\langle 5^+\rangle$														
6336(4)															
6343.9(11)	$3^-,5^-$	2976	7	7	46				18						7
6364(3)	$\langle 3^+\rangle$	2999	35	40	14									3	
6457(4)	5	3095	6.5		39.0	4.4		3.8			6.2			11.9	
6461(4)	$3^{\langle -\rangle}$	3099	4.5	13.3	25.3			2.5	5.5	12.4	11.6			6.8	16.1
6470(4)	$3,5^-$														
6481(4)															
6487(4)															
6493(4)	$7^{\langle -\rangle}$	3131			2.6	4.6	8.9	0.4					2.2	6.2	
6519(6)	$5^-,7^-$														
6530.2(25)	$\langle 3^-\rangle$														
6559(4)															
6598(9)	$5^-,7^-$														
6610.8(11)	$\langle 19^-\rangle$														
6625.1(21)	$3^{\langle +\rangle}$	3267	77.2	4.1						5.4	4.9				
6632(9)	$7^+,9^+$														
6644.0(25)	$\langle 3^-\rangle$														
6661.0(13)	$7^+,9^+$														
6690.5(14)															
6690.6(13)	$\langle 17^+\rangle$														
6708.3(7)	$3^{\langle -\rangle}$	3352	37.0	49.0					3.4	1.0	1.7				
6727.4(6)	$3^-,5^-$	3369	78.0	5.5		2.4					3.2				2.7
6745.9(6)	$5^{\langle +\rangle}$	3391	88.3			4.2					2.9				
6798.4(12)	$\langle 19^+\rangle$														
6810.1(21)	$3^{\langle -\rangle}$														
6833.9(21)	9^+	3480				19.9						12.1			1.3
6842.3(7)	3	3487	56.3	31.1	5.0				3.2		4.4				
6864.9(21)	$\langle 3^-\rangle$														
6877.1(21)	$\langle 5^+\rangle$	3524	19.3		31.3	13.6					7.4			6.1	
6885(4)	$3^-,5$	3532	12		19	18	8	10	9	[6]					[5]

(continued) $^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^*			0	491	914	1399	1865	1988	2266	2318	2324	2587	2664	2706	2715
$2J^\pi_f$			3^-	1^-	5^-	7^-	7^-	5^+	3^+	1^-5^-	3	11^-	9^-	5^-	7^-
6894(4)	$5^{\langle-\rangle}$	3539	11.0		11.2	20.0		14.2	13.0		10.6			5.0	6.0
6902.9(5)	9^+	3550			2.6	3.5	1.1					6.7			2.7
6921.5(21)	$\langle5^+\rangle$	3568			38.2			46.0							
6939(4)	$3^{\langle-\rangle}$	3585	7.7	13.3	8.6		5.7		22.2	3.7	9.8				8.0
6946.1(9)	$\langle3\rangle^-$	3591	45.6	10.6					23.7	13.0	7.1				
6967.7(21)	3,5	3613	57.6		24.3			6.3	5.9						
7299(4)	3,5	3952	72		8			6	6						
7318.7*															
7331(4)	3	3985	100												
7337.9*															
7348(4)	$3^{\langle-\rangle}$	4002	68		12										
7368.6*															
7353.9(19)	$\langle19^+\rangle$														
7391.6(14)	5^+	4048	7				8	13							
7407(4)		4062	100												
7435.5*															
7444(4)	$\langle3\rangle^+$	4099	70												
7445.5(12)	$\langle21^-\rangle$														
7471.3(14)															
7473.7(24)	$\langle1^-\rangle$														
7503(4)															
7518.2(21)	$\langle5^-\rangle$	4173	30			70									
7523(4)															
7536.4(21)	$\langle3^-\rangle$	4196	25	55	20										
7650(4)	$5^{\langle+\rangle}$	4309	60			40									
7697(4)	$\langle5\rangle$	4357	38			18	17	10							
7793.3(13)	$\langle17^+\rangle$														
7826.3(13)	$\langle17^+\rangle$														
8013(4)	$\langle3\rangle$	4678	67	33											

Additional data on this isotope can be found in [72Ma51, 77Co03].
* Additional levels introduced in [85Ti04] from spectra of direct γ-rays following proton capture.
** Additional branching ratios in [75Kl06, 77Co03, 75Di16, 75Tr05] are not given in [85Di05].
No absolute energy E^* is given in [75Tr05] and $E_\circ$=2221, 2238, 2275 keV can not be compared with others, including [85Di05] (for example, 2238 and 2275 keV resonances).
States at E^*=3487 keV [85Di05] and 3483 keV [75Kl06] are considered as a single state [02Nu0A].
Resonances at 2057 keV [75Tr05] and 2063 keV are presumably forming unresolved dublet.

Branching ratios of γ-transitions [85Di05]. Part 2. $^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage														
E^* $2J^\pi_\mathrm{f}$			2715 7^-	2928 5^-	2993 7^-	3024 5^-	3043 9^+	3114 5^-	3130 3^-	3309 7^-	3434 5	3438 1	3551 5^-	3574 5,7	3578	3615 3^-	3699 7^-
4348.9(10)	$\langle 1\rangle^-$	949				8			17								
4770.1(5)	3^-	1378	1	2					2			4					
4817.6(5)	3^-	1424									1	<1					
5053.5(9)	$\langle 5\rangle^-$	1665	7					9									
5230.7(4)	1^-	1844				1						1					
5264(3)	3^-	1883		7				12			1	1				<1	
5306(3)	$\langle 1\rangle^-$	1923				7			10			4				2	
5443.6(9)	$\langle 3\rangle^+$	2057		7				10									
5482(4)	$\langle 5\rangle^-$	2105				5	3	5							4		
5522.3(4)	5	2143	1														
5550.0(6)	3,5	2172		7				4			1	1	3			5	
5600.8(7)	$\langle 3\rangle$	2225				13											
5620(4)	$7^{\langle -\rangle}$	2238	2	1			3										
5645.0(8)	3^-,5^-	2266			7			3									2
5657(4)	5	2282	12	2		1							1		3	5	
5711(4)	5/2^-	2337	4					4			4				6		
5719(4)	3,5^-	2344		7		5											
5880.7(7)	3^-,5^-	2509	3														1
5897(4)	$7^{\langle -\rangle}$	2525						6									
6039(4)	$3^{\langle +\rangle}$	2670	2	2									<1		4		1
6091.8(7)	3	2723				3									1		
6197(4)	$\langle 3\rangle$	2831	8												22		
6201(4)	3	2835		4		5		13				6					
6206(4)	9^+	2839	3				84	3									
6236.7(9)	3^-	2872				4									9		
6303.9(10)	$3^{\langle -\rangle}$	2935	5	20				8								2	
6343.9(11)	3^-,5^-	2976	7		3	1							8		3		<1
6364(3)	$\langle 3^+\rangle$	2999													8		
6457(4)	5	3095		1.1	2.7			1.7	1.4		1.7	1.2	1.5	6.7			4.7
6461(4)	$3^{\langle -\rangle}$	3099	16.1			3.0			7.4						4.5	1.9	
6493(4)	$7^{\langle -\rangle}$	3131		7.2			1.7	1.5		14.5	6.4		1.9	4.4			3.7
6625.1(21)	$3^{\langle +\rangle}$	3267		2.1							1.3				5.0		
6708.3(7)	$3^{\langle -\rangle}$	3352		2.7					2.5			2.7					
6727.4(6)	3^-,5^-	3369	2.7												4.0		
6745.9(6)	$5^{\langle +\rangle}$	3391													2.3		
6833.9(21)	9^+	3480	1.3				64.9										
6877.1(21)	$\langle 5^+\rangle$	3524			13.7			4.2							4.4		
6894(4)	$5^{\langle -\rangle}$	3539	6.0					3.5				5.5					
6902.9(5)	9^+	3550	2.7				76.1										
6921.5(21)	$\langle 5^+\rangle$	3568													15.8		
6967.7(21)	3,5	3613							2.0						3.9		
7299(4)	3,5	3952							8								

(continued) $^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage														
E^*			2715	2928	2993	3024	3043	3114	3130	3309	3434	3438	3551	3574	3578	3615	3699
$2J_f^\pi$			7^-	5^-	7^-	5^-	9^+	5^-	3^-	7^-	5	1	5^-	5,7		3^-	7^-
7348(4)	$3^{\langle -\rangle}$	4002													20		
7391.6(14)	5^+	4048													72		
7444(4)	$\langle 3\rangle^+$	4099													15	15	

Branching ratios of γ-transitions [85Di05]. Part 3. $^{59}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage														
E^*			3729	3742	3756	3887	3906	3930	4072	4183	4207	4301	4307	4441	4465	4530	4917
$2J_f^\pi$			3,5	3^-													
4770.1(5)	3^-	1378		2													
5264(3)	3^-	1883					3										
5306(3)	$\langle 1\rangle^-$	1923					2										
5550.0(6)	3,5	2172		3													
5620(4)	$7^{\langle -\rangle}$	2238								11							
5711(4)	$5/2^-$	2337		2													
6493(4)	$7^{\langle -\rangle}$	3131				1.8	1.1	1.3	2.2	3.9	4.9	1.2	1.3				
6727.4(6)	$3^-,5^-$	3369				2.3	1.9										
6745.9(6)	$5^{\langle +\rangle}$	3391				2.3											
6833.9(21)	9^+	3480														1.8	
6902.9(5)	9^+	3550			1.5												
6939(4)	$3^{\langle -\rangle}$	3585	16.3														

Partial radiative widths [77Kr06]. $^{59}_{29}$**Cu**(p)

E^* [keV]	$E_\circ$ [keV]	$2J^\pi$	Partial radiative widths [meV]															Ref.
E^*			0	491	914	1868	1988	2266	2318	2324	2370	2706	2928	3025	3114	3130	3434	
$2J_f^\pi$			3^-	1^-	5^-	5	5^+	3^+		3		5^-	5^-	5^-	5^-	3^-	5	
4350.4	949	$\langle 1^-\rangle$	3	8				8	12					5	4	7		77Kr06
4817.4	1424.1	3^-	80	320	15		45	20		10								77Kr06
5230.2	1843.7	1^-	1500	90				70										77Kr06

(continued) $^{59}_{29}$**Cu**(p)

E^* [keV]	$E_\circ$ [keV]	$2J^\pi$	Partial radiative widths [meV]															Ref.
E^*			0	491	914	1868	1988	2266	2318	2324	2370	2706	2928	3025	3114	3130	3434	
$2J^\pi_\mathrm{f}$			3^-	1^-	5^-	5	5^+	3^+		3		5^-	5^-	5^-	5^-	3^-	5	
5266.6	1881	3^-	15	10	4				5			7	4		7		4	77Kr06
5308.9	1924	$\langle 3,1\rangle$	30							130				18		17		77Kr06
6305	2938		48	150		27	82	15		22	14	32	82		41			79Kr20

Target isotope: $^{60}_{28}$Ni $I^\pi_\circ = 0^+$ *Abundance:* 26.223(8) % $S_\mathrm{p} = 4800.4(12)$ keV $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ^2_p [keV]	Γ [eV]	Γ_p/Γ	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	Γ_γ [eV]	$S_{\mathrm{p}\gamma}$ [meV]	E^*_analog [keV]	E_cm [keV]	E^* [keV]	Ref.
725(2)					6**								713	5514	57Bu64
895(2)					5								880	5681	57Bu64
1029(2)					11								1012	5813	57Bu64
1066(2)					25						4.9(19)		1049	5849.9	57Bu64 89Ti01
1078(2)					20						6.7(19)		1060	5860.6	57Bu64 89Ti01
1132(2)					25						8(2)		1113	5917.0	57Bu64 89Ti01
1167(2)					85						2.6(7)		1148	5960.2	57Bu64 89Ti01
1197(2)					70						4.5(14)		1177	5972.4	57Bu64 89Ti01
1209(2)					75						32(5)		1189	5987.2	57Bu64 89Ti01
1239(2)					70								1219	6019	57Bu64
1247(2)					60						44(6)		1227	6026.6	57Bu64 89Ti01
1313(2)					120								1291	6092	57Bu64
1319(2)					150						140(20)		1297	6098.4	57Bu64 89Ti01
1323(2)					180								1301	6102	57Bu64
1331(2)					25								1309	6110	57Bu64
1343(2)					280								1321	6121	57Bu64
1347(2)					260						180(30)		1325	6124.1	57Bu64 89Ti01
1371(2)					90						22(8)		1349	6150.4	57Bu64 89Ti01
1381(2)					120								1358	6159	57Bu64
1415(2)					220						25(9)		1392	6193.0	57Bu64 89Ti01
1431(2)					120						22(9)		1408	6210	57Bu64 89Ti01
1451(2)					600						400(50)		1427	6227.1	57Bu64 89Ti01
1461(2)					100								1437	6237	57Bu64
1465(2)					75								1441	6241	57Bu64
1483(2)					90								1459	6259	57Bu64
1491(2)					90								1467	6267	57Bu64
1515(2)					280								1490	6291	57Bu64
1519(2)					450						83(16)		1494	6293.4	57Bu64 89Ti01
1529(2)					40								1504	6304	57Bu64
1538(2)					250						160(20)		1513	6313.6	57Bu64 89Ti01

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
1566(2)				150					1540	6341	57Bu64
1577(2)				250			110(20)		1551	6352.2	57Bu64 89Ti01
1588(2)	⟨3^-⟩			650			99(17)		1562	6362.7	65Go02 57Bu64 86Iz01 89Ti01
1599(2)	3^-			1600	0.72	0.15(3)	390(50)		1573	6374.0	75Kr06 57Bu64 86Iz01 89Ti01
1605(2)	3^-			1550	0.54	0.25(5)	450(50)	0.0	1579	6379.9	75Kr06 57Bu64 86Iz01 89Ti01
1620(2)	3^-			1500	0.50	0.20(4)	530(60)		1593	6394.3	75Kr06 57Bu64 86Iz01 89Ti01
1639(2)				95					1612	6413	57Bu64
1643(2)				240			480(60)		1616	6418.3	57Bu64 89Ti01
1649(2)				210					1622	6422	57Bu64
1656(2)	1^-			700	0.60	0.43(10)	540(60)		1629	6431.0	75Kr06 57Bu64 89Ti01
1668(2)	⟨5^+⟩			290			150(30)		1641	6442.7	57Bu64 79Bo09 89Ti01
1674(2)				950					1647	6447	57Bu64
1679(2)				350					1651	6452	57Bu64
1694(2)				700			260(40)		1666	6467.1	57Bu64 89Ti01
1698(2)				230					1670	6471	57Bu64
1711(2)				170			51(13)		1683	6486.4	57Bu64 89Ti01
1721(2)				80					1693	6493	57Bu64
1734(2)				550					1706	6506	57Bu64
1739(2)				220			140(20)		1710	6509.1	57Bu64 89Ti01
1757(2)				400					1728	6529	57Bu64
1764(2)				450					1735	6536	57Bu64
1770(2)				550			430(50)		1741	6541.3	65Go02 57Bu64 89Ti01
1783(2)				450					1754	6554	57Bu64
1793(2)				350			65(16)		1764	6566.7	57Bu64 89Ti01
1814(2)	1^+	25(10)	10.0			1.26	100(20)		1784	6590.7	89Ti01 70Br33 79Bo09
1835							93(18)		1805	6606.4	81By03 89Ti01
1856(2)	1^-	25(10)	18.5		0.33	0.034(10)	580(70)		1826	6620.3	75Kr06 70Br33 89Ti01
1860							65(14)		1829	6629.8	89Ti01
1877(2)	1^-	30(10)	20.3		0.35	0.07(2)	170(30)		1846	6644.5	89Ti01 70Br33 75Kr06
1886(2)	1^-	25(10)	18.5						1855	6656	76Bi0A 70Br33
1909(2)	⟨1^-⟩	9(5)	2.94				280(40)		1878	6681.2	76Bi0A 70Br33 89Ti01
1925(2)	1^+,3^+	20(10)	4.50						1893	6694	76Bi0A 70Br33 79Bo09
1930	3^+,3^-						370(50)		1898	6699.0	86Iz01 79Bo09 89Ti01
1938	3^+								1906	6707	79Bo09
1944	3^-,5^-						89(15)		1912	6713.8	86Iz01 89Ti01
1957							72(13)		1925	6725.7	89Ti01
1972	3^-,5						350(40)		1940	6744.7	86Iz01 89Ti01
1995	5^-						210(30)		1962	6762.7	86Iz01 89Ti01
2032	3^+						69(14)		1999	6784.6	79Bo09 89Ti01
2035	1^-								2002	6802	86Iz01
2036(2)	1^+	15(5)	2.05			0.63	115(18)		2003	6804.0	89Ti01 70Br33
2047	3,5						160(20)		2013	6815.0	86Iz01 89Ti01
2082							150(20)		2047	6847.8	89Ti01
2102							490(50)		2068	6868.4	89Ti01
2124							200(30)		2089	6889.5	89Ti01

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E_{cm} [keV]	E^* [keV]	Ref.
2150(5)	3^-										260(30)	2112	6912.5	89Ti01
2173(5)	3^-											2137	6938	87IzZZ
2189(2)	1^+		90(15)	6.70							280(30)	2153	6940.3	89Ti01 70Br33
2208											480(50)	2172	6972.0	89Ti01
2228(2)	1^+		25(10)	1.60							540(60)	2191	6997.3	89Ti01 70Br33
2242(5)	3^-										180(20)	2214	7014.1	89Ti01
2260	5^+										140(20)	2223	7028.5	79Bo09 89Ti01
2276(2)	$1^+,3^+$		60(10)	3.20						4.62	1040(100)	2239	7043.2	89Ti01 70Br33 79Bo09
2283(5)	3^-											2246	7046	87IzZZ
2292(2)	$1^+,5^+$		45(10)	2.30								2254	7055	76Bi0A 70Br33 79Bo09
2296	5^+										650(70)	2258	7060.3	79Bo09 89Ti01
2322(2)	$\langle 3^- \rangle$		3(3)	0.25							200(30)	2284	7090.5	76Bi0A 70Br33 89Ti01
2346(2)	$\langle 1^+ \rangle$		3(5)	0.21						2.28		2308	7108	76Bi0A 70Br33
2352(2)	$\langle 3^- \rangle$		3(3)	0.23								2313	7114	76Bi0A 70Br33
2398(5)	5^-											2359	7159	87IzZZ
2437(2)	1^+		60(10)	1.89								2397	7197	76Bi0A 70Br33
2442(5)	3											2402	7202	87IzZZ
2455(5)	3											2415	7215	87IzZZ
2464(2)	1^+		25(10)	0.69						0.46		2424	7224	76Bi0A 70Br33
2482(2)	$\langle 3^- \rangle$		5(3)	0.15								2441	7242	70Br33
2504(2)	1^+		145(20)	3.73						5.46		2463	7263	76Bi0A 70Br33
2515(2)	$\langle 3^- \rangle$		3(3)	0.14								2474	7274	76Bi0A 70Br33
2525(2)	1^+		20(10)	0.49						4.60		2484	7284	76Bi0A 70Br33
2555	5^+											2513	7314	79Bo09
2558(2)	1^+		90(15)	1.98								2516	7317	76Bi0A 70Br33
2571(2)	$\langle 3^- \rangle$		8(5)	0.34								2529	7329	76Bi0A 70Br33 79Bo09
2621(2)	5^+		25(10)	4.18								2578	7378	76Bi0A 70Br33
2658(2)	$\langle 3^- \rangle$		5(5)	0.13								2614	7415	76Bi0A 70Br33
2672	5^-											2628	7429	79Bo09
2674(2)	1^+		10(5)	0.16								2630	7431	76Bi0A 70Br33
2682(2)	1^+		75(15)	1.22								2638	7438	76Bi0A 70Br33
2719(2)	$\langle 3^- \rangle$		25(10)	0.54								2674	7475	76Bi0A 70Br33
2730(2)	$\langle 3^- \rangle$		8(10)	0.22								2685	7486	76Bi0A 70Br33
2734(2)	$\langle 3^- \rangle$		15(10)	0.43								2689	7490	76Bi0A 70Br33
2742(2)	$\langle 3^- \rangle$		8(10)	0.21								2697	7497	76Bi0A 70Br33
2755(2)	$1^+,5^+$		10(5)	0.13								2710	7510	76Bi0A 70Br33 79Bo09
2765(2)	$\langle 3^- \rangle$		5(5)	0.13								2720	7520	76Bi0A 70Br33
2771(2)	$\langle 5^+ \rangle$		5(5)	0.54								2726	7526	76Bi0A 70Br33
2787(2)	$\langle 3^- \rangle$		18(10)	0.44								2741	7542	76Bi0A 70Br33
2795(2)	$1^+,3^+$		55(15)	0.65								2749	7550	76Bi0A 70Br33 79Bo09
2800(2)	$\langle 3^- \rangle$		13(10)	0.30								2754	7555	76Bi0A 70Br33
2802(2)	$\langle 3^- \rangle$		5(5)	0.12								2756	7557	76Bi0A 70Br33
2806(2)	$1^+,3^+$		110(25)	1.27								2760	7560	76Bi0A 70Br33 79Bo09
2815(2)	$\langle 5^+ \rangle$		5(5)	0.47								2769	7569	76Bi0A 70Br33 79Bo09
2825(2)	$\langle 3^- \rangle$		83(25)	1.87								2779	7579	76Bi0A 70Br33

(continued) $^{61}_{29}\mathbf{Cu}$(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ^2_p [keV]	Γ [eV]	Γ_p/Γ	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	Γ_γ [eV]	$S_{\mathrm{p}\gamma}$ [meV]	E_cm [keV]	E^* [keV]	Ref.
2828(2)	⟨3^-⟩		13(10)	0.26								2782	7582	76Bi0A 70Br33
2830(2)	⟨3^-⟩		58(25)	1.29								2784	7584	76Bi0A 70Br33
2835(2)	⟨3^-⟩		13(10)	0.28								2789	7589	76Bi0A 70Br33
2855(2)	⟨3^-⟩		5(5)	0.11								2808	7609	76Bi0A 70Br33
2878(2)	⟨5^+⟩		10(5)	0.80								2831	7631	76Bi0A 70Br33
2884(2)	1^+		161(20)	1.55								2837	7637	76Bi0A 70Br33
2895(2)	1^+,3^+		70(15)	0.68								2848	7648	76Bi0A 70Br33 79Bo09
2896(2)	⟨5^+⟩		20(10)	1.56								2849	7649	76Bi0A 70Br33 79Bo09
2905(2)	⟨3^-⟩		8(5)	0.14								2857	7658	76Bi0A 70Br33
2910(2)	⟨5^+⟩		5(5)	0.37								2862	7663	76Bi0A 70Br33
2920(2)	⟨5^+⟩		5(5)	0.36								2872	7673	76Bi0A 70Br33
2929(2)	1^+		45(10)	0.39								2881	7681	76Bi0A 70Br33
2950.3	3^+		55(8)	3.64								2902	7702	76FlZY
2950.9	5^+		12(6)	0.79								2900	7700	76FlZY 76Bi0A 70Br33
2953.5	1^-		45(15)	0.76								2903	7703	76FlZY 76Bi0A 70Br33
2971.0	3^+		65(10)	4.08								2919	7720	76FlZY 76Bi0A 70Br33
2974(2)	⟨3^-⟩		3(3)	0.04								2925	7726	76Bi0A 70Br33
2977.3	1^-		45(15)	0.71								2926	7727	76FlZY 76Bi0A 70Br33
2989.9	1^+		140(28)	1.06	140(28)							2940	7741(3)	76Ar0A 76FlZY
3011.2	5^+		23(7)	1.30								2961	7762	76FlZY
3014.1	1^+		400(80)	2.88	400(80)							2964	7765(3)	76Ar0A 76FlZY
3031.4	3^-		15(5)	0.21								2981	7782	76FlZY
3034.7	5^+		30(10)	1.60	30(10)							2982	7783(3)	76Ar0A 76FlZY
3055.7	3^+		56(15)	2.84	30(10)							3003	7803(3)	76FlZY 76Ar0A
3053.8	1^+		120(24)	0.80	120(24)							3003	7804(3)	76Ar0A 76FlZY
3090.6	1^+		70(14)	0.43	70(14)							3039	7840(3)	76Ar0A 76FlZY
3088.0	3^+		35(10)	1.65								3037	7837	76FlZY
3099.4	3^+		80(10)	3.66	50(10)							3046	7846(3)	76FlZY 76Ar0A
3103.0	1^-		40(10)	0.47	40(10)							3052	7853(3)	76Ar0A 76FlZY
3105.8	3^-		55(8)	0.66								3054	7855	76FlZY
3137.5	1^-		50(10)	0.56								3086	7886	76FlZY
3145.5	1^-		45(8)	0.50								3093	7894	76FlZY
3145.6	1^+		150(30)	0.83	150(30)							3094	7894(3)	76Ar0A 76FlZY
3171.0	1^+		20(8)	0.11								3119	7919	76FlZY
3170.5	1^-		250(50)	2.58	250(50)							3118	7919(3)	76Ar0A 76FlZY
3183.2	5^+		12(6)	0.45	20(10)							3128	7928(3)	76FlZY 76Ar0A
3192.5	1^+		200(40)	1.02	200(40)							3140	7940(3)	76Ar0A 76FlZY
3199.2	3^+		45(6)	1.63	20(10)							3143	7943(3)	76FlZY 76Ar0A
3199.8	1^-		35(10)	0.34	35(10)							3147	7947(3)	76Ar0A 76FlZY
3211.7	1^+		300(60)	1.48	300(60)							3159	7959(3)	76Ar0A 76FlZY
3222.9	1^+		22(10)	0.11								3170	7970	76FlZY
3224.6	3^-		20(8)	0.19								3171	7972	76FlZY
3237.5	1^+		150(30)	0.71	150(30)							3184	7984(3)	76Ar0A 76FlZY
3247.2	1^+		100(20)	0.46	100(20)							3194	7994(3)	76Ar0A 76FlZY
3256.2	3^-		30(10)	0.26	30(10)							3202	8003(3)	76Ar0A 76FlZY

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3265.5	1^-		50(8)	0.43	30(10)								3212	8012(3)	76FlZY 76Ar0A
3269***	3^+		115(10)	3.58									3215	8015	76FlZY
3269.8	1^-		50(8)	0.43	15(10)								3216	8016(3)	76FlZY 76Ar0A
3277***	5^+		60(8)	1.84	20(10)								3219	8020(3)	76FlZY 76Ar0A
3282.0	5^+		15(4)	0.45	20(10)								3228	8029(3)	76FlZY 76Ar0A
3285.3	5^+		20(8)	0.60									3231	8031	76FlZY
3297.	5^+		17(8)	0.50	20(10)								3240	8040(3)	76FlZY 76Ar0A
3308.5	1^+		300(60)	1.25	300(60)								3254	8054.7(30)	76Ar0A 76FlZY
3308.9	1^-		25(20)	0.20									3254	8055	76FlZY
3322.	5^+		25(6)	0.69	25(10)								3264	8065(3)	76FlZY 76Ar0A
3329.9	3^-		50(8)	0.38	50(10)								3272	8072(3)	76FlZY 76Ar0A
3327.7	1^+		20(10)	0.08	20(10)								3273	8073(3)	76Ar0A 76FlZY
3338.1	1^+		200(40)	0.79	200(40)								3283	8083(3)	76Ar0A 76FlZY
3344.9	5^+		6(4)	0.16									3290	8090	76FlZY
3348.8	1^-		40(10)	0.29	40(10)								3293	8094(3)	76Ar0A 76FlZY
3351.6	3^-		50(5)	0.37									3296	8097	76FlZY
3353.3	1^+		20(10)	0.08	20(10)								3298	8098(3)	76Ar0A 76FlZY
3363.6	1^+		15(5)	0.06									3308	8108	76FlZY
3369***	5^+		15(4)										3313	8114	76FlZY
3370.5	1^-		40(10)	0.28	40(10)								3315	8115(3)	76Ar0A 76FlZY
3375.9	5^+		20(6)	0.50	15(10)								3317	8117(3)	76FlZY 76Ar0A
3373.8	1^+		300(60)	1.12	300(60)								3318	8118(3)	76Ar0A
3374.4	1^+		80(16)	0.30	80(16)								3319	8119(3)	76Ar0A
3377.8	3^-		65(8)	0.46									3322	8122	76FlZY
3383.1	5^+		30(7)	0.73	30(10)								3325	8125(3)	76FlZY 76Ar0A
3383.0	1^+		30(10)	0.11	30(10)								3328	8128(3)	76Ar0A 76FlZY
3391.7	1^-		40(10)	0.27	40(10)								3336	8136(3)	76Ar0A 76FlZY
3398.8	3^-		20(10)	0.14	20(10)								3343	8143(3)	76Ar0A
3402.5	5^+		17(5)	0.40	10(10)								3347	8148(3)	76FlZY 76Ar0A
3404.6	1^+		145(15)	0.52									3348	8149	76FlZY
3407.2	5^+		15(5)	0.35	10(10)								3352	8153(3)	76FlZY 76Ar0A
3412***	5^+		60(6)	1.39	30(10)								3358	8158(3)	76FlZY 76Ar0A
3418***	5^+		75(8)	1.71	70(14)								3364	8164(3)	76FlZY 76Ar0A
3421.0	1^-		15(10)	0.97	15(10)								3365	8165(3)	76Ar0A 76FlZY
3422.7	1^-		40(10)	0.26	40(10)								3366	8167(3)	76Ar0A 76FlZY
3424***	5^+		100(10)	2.26									3367	8168	76FlZY
3425.6	1^+		60(12)	0.21	60(12)								3369	8169(3)	76Ar0A 76FlZY
3427***	5^+		25(5)	0.56									3370	8171	76FlZY
3427.5	1^+		300(60)	1.03	300(60)								3371	8171(3)	76Ar0A 76FlZY
3434***	3^-		55(6)	0.35	40(10)								3374	8174(3)	76FlZY 76Ar0A
3437.5	1^-		90(10)	0.57									3381	8181	76FlZY
3443.9	5^+		35(6)	0.76	30(10)								3383	8183(3)	76FlZY 76Ar0A
3450.8	5^+		10(5)	0.21	15(10)								3389	8190(3)	76FlZY 76Ar0A
3457.0	1^+		70(14)	0.23	70(14)								3400	8201(3)	76Ar0A
3466.6	$\langle 5^+ \rangle$		10(10)	0.21	10(10)								3409	8210(3)	76Ar0A

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3476.0	1^+		490(100)	1.57	700(140)	0.70							3419	8219(3)	76Ar0A
3479.3	1^-		40(10)	0.24	40(10)								3422	8222(3)	76Ar0A
3481.3	$\langle 5^+ \rangle$		15(10)	0.30	15(10)								3424	8224(3)	76Ar0A
3487.8	$\langle 3^+ \rangle$		15(10)	0.30	15(10)								3430	8231(3)	76Ar0A
3493.5	$\langle 5^+ \rangle$		15(10)	0.30	15(10)								3436	8236(3)	76Ar0A
3504.7	$\langle 3^+ \rangle$		40(10)	0.77	40(10)								3447	8247(3)	76Ar0A
3507.7	1^-		40(10)	0.22	40(10)								3450	8250(3)	76Ar0A
3513.3	$\langle 5^+ \rangle$		30(10)	0.57	30(10)								3455	8256(3)	76Ar0A
3514.6	1^+		150(30)	0.45	150(30)								3457	8257(3)	76Ar0A
3524.3	1^+		80(16)	0.24	80(16)								3466	8267(3)	76Ar0A
3526.3	$\langle 3^+ \rangle$		20(10)	0.37	20(10)								3468	8268(3)	76Ar0A
3530.2	1^-		40(10)	0.22	40(10)								3472	8272(3)	76Ar0A
3537.3	$\langle 3^+ \rangle$		15(10)	0.27	15(10)								3479	8279(3)	76Ar0A
3546.7	$\langle 3^+ \rangle$		20(10)	0.36	20(10)								3488	8289(3)	76Ar0A
3548.2	3^-		20(10)	0.11	20(10)								3490	8290(3)	76Ar0A
3554.4	1^+		1300(260)	3.71	1300(260)								3496	8296(3)	76Ar0A
3557.0	1^+		1300(260)	3.69	1300(260)								3499	8299(3)	76Ar0A
3559.0	1^+		60(12)	0.17	60(12)								3501	8301(3)	76Ar0A
3566.0	1^-		40(10)	0.20	40(10)								3508	8308(3)	76Ar0A
3569.7	1^+		120(24)	0.33	120(24)								3511	8311(3)	76Ar0A
3582.5	1^+		845(170)	2.32	1300(260)	0.65							3523	8324(3)	76Ar0A
3595.4	1^+		500(100)	1.36	840(170)	0.60							3536	8336(3)	76Ar0A
3602.3	1^+		250(50)	0.67	500(100)	0.50							3543	8343(3)	76Ar0A
3614.6	$\langle 3^+ \rangle$		40(10)	0.63	40(10)								3555	8355(3)	76Ar0A
3619.2	$\langle 5^+ \rangle$		20(10)	0.31	20(10)								3559	8360(3)	76Ar0A
3620.3	1^-		60(12)	0.28	60(12)								3561	8361(3)	76Ar0A
3623.0	$\langle 5^+ \rangle$		15(10)	0.23	15(10)								3564	8364(3)	76Ar0A
3623.9	1^-		40(10)	0.19	40(10)								3564	8364(3)	76Ar0A
3628.0	$\langle 5^+ \rangle$		30(10)	0.46	30(10)								3569	8369(3)	76Ar0A
3632.1	$\langle 5^+ \rangle$		25(10)	0.38	25(10)								3572	8373(3)	76Ar0A
3637.2	1^+		60(12)	0.15	60(12)								3577	8378(3)	76Ar0A
3639.6	$\langle 3^+ \rangle$		60(12)	0.90	60(12)								3579	8380(3)	76Ar0A
3653.2	$\langle 3^+ \rangle$		20(10)	0.29	20(10)								3593	8393(3)	76Ar0A
3654.0	1^+		20(10)	0.05	20(10)								3594	8395(3)	76Ar0A
3673.6	$\langle 5^+ \rangle$		60(12)	0.85	60(12)								3613	8413(3)	76Ar0A
3675.0	$\langle 3^+ \rangle$		30(10)	0.42	30(10)								3615	8415(3)	76Ar0A
3675.5	1^-		109(10)	0.47	109(10)								3615	8415(3)	76Ar0A
3683.0	1^+		300(60)	0.72	300(60)								3623	8423(3)	76Ar0A
3687.2	1^-		56(8)	0.24	56(8)								3626	8427(3)	76Ar0A
3688.5	$\langle 5^+ \rangle$		10(10)	0.14	10(10)								3628	8428(3)	76Ar0A
3697.5	$\langle 3^+ \rangle$		15(10)	0.20	15(10)								3636	8437(3)	76Ar0A
3699.8	$\langle 5^+ \rangle$		60(12)	0.81	60(12)								3639	8439(3)	76Ar0A
3702.0	9^+		2.0*		2.0								3641	8442(3)	90Sz01
3702.2	1^+		830(160)	1.94	1040(200)	0.80							3641	8441(3)	76Ar0A
3706.4	9^+		3.9*		3.9								3645	8446(3)	90Sz01

(continued)

$^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E_{cm} [keV]	E^* [keV]	Ref.
3707.6	1^+		250(50)	0.58	250(50)							3646	8447(3)	76Ar0A
3709.0	3^-		80(16)	0.33	80(16)							3648	8449(3)	76Ar0A
3709.4	9^+		2.0*		2.0							3648	8449(3)	90Sz01
3712.0	$\langle 5^+ \rangle$		20(10)	0.27	20(10)							3651	8452(3)	76Ar0A
3713.0	9^+		2.1*		2.1							3652	8453(3)	90Sz01
3716.2	$\langle 5^+ \rangle$		15(10)	0.20	15(10)							3655	8455(3)	76Ar0A
3717.0	3^-		60(12)	0.24	60(12)							3656	8457(3)	76Ar0A
3719.6	9^+		11.1(7)*	8.01	11.1(7)		0.82	0.08	0.71			3658	8459(3)	92Ho01 90Sz01
3720.9	9^+		9.5*		9.5							3659	8460(3)	90Sz01
3726.4	$\langle 5^+ \rangle$		15(10)	0.19	15(10)							3665	8465(3)	76Ar0A
3728.7	9^+		7.1(5)*	5.02	7.1(5)		0.61	0.07	0.41			3667	8468(3)	92Ho01 90Sz01
3729.8	1^-		155(6)	0.62	155(6)							3668	8469(3)	76Ar0A
3730.8	9^+		5.2*		5.2							3669	8470(3)	90Sz01
3733.6	9^+		6.7(5)*	4.68	6.7(5)		0.32	0.04				3672	8472(3)	90Sz01
3736.4	9^+		2.5*		2.5							3675	8475(3)	90Sz01
3739.1	1^-		1222(54)	4.81	1222(54)							3677	8478(3)	76Ar0A
3740.5	9^+		6.1*		6.1							3679	8479(3)	90Sz01
3743.3	1^+		980(200)	2.17	980(200)							3681	8482(3)	76Ar0A
3746.0	$\langle 5^+ \rangle$		30(10)	0.38	30(10)							3685	8485(3)	76Ar0A
3748.2	1^+		192(38)	0.42	480(95)	0.40						3686	8487(3)	76Ar0A
3749.4	1^-		537(36)	2.08	537(36)							3687	8488(3)	76Ar0A
3755.8	1^+		600(120)	1.31	600(120)							3694	8494(3)	76Ar0A
3759.4	3^-		110(7)	0.42	110(7)							3697	8498(3)	76Ar0A
3764.5	$\langle 5^+ \rangle$		20(10)	0.24	20(10)							3702	8503(3)	76Ar0A
3766.8	$\langle 5^+ \rangle$		60(12)	0.73	60(12)							3705	8505(3)	76Ar0A
3778.6	1^+		160(32)	0.34	400(80)	0.40						3716	8517(3)	76Ar0A
3789.3	1^+		375(75)	0.78	750(150)	0.50						3727	8527(3)	76Ar0A
3790.9	$\langle 5^+ \rangle$		30(10)	0.35	30(10)							3728	8529(3)	76Ar0A
3801.4	1^+		50(10)	0.10	50(10)							3739	8539(3)	76Ar0A
3803.4	$\langle 5^+ \rangle$		60(12)	0.68	60(12)							3741	8541(3)	76Ar0A
3806.6	$\langle 5^+ \rangle$		15(10)	0.17	15(10)							3744	8544(3)	76Ar0A
3809.0	$\langle 5^+ \rangle$		15(10)	0.17	15(10)							3747	8547(3)	76Ar0A
3811.0	1^+		108(22)	0.22	360(72)	0.30						3749	8549(3)	76Ar0A
3820.0	$\langle 5^+ \rangle$		15(10)	0.17	15(10)							3757	8558(3)	76Ar0A
3821.5	1^+		400(80)	0.80	800(160)	0.50						3758	8559(3)	76Ar0A
3832.4	$\langle 5^+ \rangle$		40(10)	0.44	40(10)							3769	8570(3)	76Ar0A
3837.5	1^+		160(32)	0.32	400(80)	0.40						3774	8575(3)	76Ar0A
3842.8	1^+		2560(510)	5.02	3200(640)	0.80						3779	8580(3)	76Ar0A
3849.4	$\langle 5^+ \rangle$		50(10)	0.16	50(10)							3786	8586(3)	76Ar0A
3854.1	3^-		19.1(33)	0.06	19.1(33)							3790	8591(3)	76Ar0A
3855.2	$\langle 3^+ \rangle$		20(10)	0.21	20(10)							3792	8592(3)	76Ar0A
3857.3	1^-		70(14)	0.21	70(14)							3794	8594(3)	76Ar0A
3862.0	$\langle 5^+ \rangle$		30(10)	0.31	30(10)							3799	8599(3)	76Ar0A
3880.7	1^+		1370(280)	2.57	1960(400)	0.70						3817	8617(3)	76Ar0A
3890.0	$\langle 5^+ \rangle$		25(10)	0.25	25(10)							3826	8627(3)	76Ar0A

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3893.8	1^+		72(15)	0.13	240(50)	0.30							3830	8630(3)	76Ar0A
3894.9	3^-		80(16)	0.25	80(16)								3831	8631(3)	76Ar0A
3897.1	1^-		40(10)	0.11	40(10)								3833	8633(3)	76Ar0A
3898.6	$\langle 5^+ \rangle$		15(10)	0.17	15(10)								3834	8635(3)	76Ar0A
3899.9	1^-		160(32)	0.45	160(32)								3836	8636(3)	76Ar0A
3903.0	1^+		880(175)	1.61	1260(250)	0.70							3839	8639(3)	76Ar0A
3906.6	$\langle 3^+ \rangle$		20(10)	0.19	20(10)								3842	8643(3)	76Ar0A
3915.1	1^+		1570(315)	2.84	2100(420)	0.75							3850	8651(3)	76Ar0A
3917.8	$\langle 5^+ \rangle$		20(10)	0.19	20(10)								3853	8654(3)	76Ar0A
3924.1	$\langle 5^+ \rangle$		20(10)	0.19	20(10)								3859	8660(3)	76Ar0A
3929.6	1^+		30(10)	0.05	30(10)								3865	8665(3)	76Ar0A
3935.4	$\langle 5^+ \rangle$		100(20)	0.93	100(20)								3870	8671(3)	76Ar0A
3938.5	1^+		2880(580)	5.05	3600(720)	0.80							3873	8674(3)	76Ar0A
3942.6	1^+		290(58)	0.50	480(96)	0.60							3878	8678(3)	76Ar0A
3944.0	$\langle 5^+ \rangle$		20(10)	0.18	20(10)								3879	8680(3)	76Ar0A
3952.4	$\langle 5^+ \rangle$		120(24)	1.08	120(24)								3887	8688(3)	76Ar0A
3955.4	$\langle 5^+ \rangle$		50(10)	0.45	50(10)								3890	8691(3)	76Ar0A
3963.9	$\langle 3^+ \rangle$		30(10)	0.27	30(10)								3898	8699(3)	76Ar0A
3965.9	1^+		60(12)	0.10	60(12)								3900	8701(3)	76Ar0A
3967.9	$\langle 5^+ \rangle$		40(10)	0.35	40(10)								3902	8703(3)	76Ar0A
3970.6	$\langle 5^+ \rangle$		70(14)	0.61	70(14)								3905	8705(3)	76Ar0A
3971.6	1^+		80(16)	0.14	80(16)								3906	8706(3)	76Ar0A
3976.2	$\langle 5^+ \rangle$		50(10)	0.44	50(10)								3911	8711(3)	76Ar0A
3985.7	$\langle 3^+ \rangle$		20(10)	0.17	20(10)								3920	8720(3)	76Ar0A
3988.6	1^+		500(100)	0.84	840(170)	0.60							3923	8723(3)	76Ar0A
3991.1	$\langle 5^+ \rangle$		50(10)	0.43	50(10)								3925	8726(3)	76Ar0A
3994.0	1^+		144(29)	0.24	480(95)	0.30							3929	8729(3)	76Ar0A
3996.3	$\langle 3^+ \rangle$		30(10)	0.25	30(10)								3930	8731(3)	76Ar0A
4001.8	$\langle 3^+ \rangle$		20(10)	0.17	20(10)								3936	8736(3)	76Ar0A
4002.8	1^+		100(20)	1.64	100(20)								3937	8737(3)	76Ar0A
4006.9	$\langle 5^+ \rangle$		30(10)	0.25	30(10)								3941	8741(3)	76Ar0A
4008.4	1^-		60(12)	0.17	60(12)								3942	8743(3)	76Ar0A
4009.8	$\langle 5^+ \rangle$		50(10)	0.41	50(10)								3944	8744(3)	76Ar0A
4016.2	$\langle 5^+ \rangle$		70(14)	0.57	70(14)								3950	8750(3)	76Ar0A
4017.4	1^-		100	0.28	100	1.0							3951	8752(3)	86Oz0A
4017.4	1^-		100	0.28	100	1.0							3951	8752(3)	86Oz0A
4018.8	3^+		200	1.7	230	0.87	–0.05						3952	8753(3)	86Oz0A
4018.8	3^+		200	1.7	230	0.87	–0.05						3952	8753(3)	86Oz0A
4022.4	5^+		20	0.17	30	0.67	0.5	0.4	–0.1				3956	8756(5)	86Oz0A
4022.4	5^+		20	0.17	30	0.67	0.5	0.4	–0.1				3956	8756(5)	86Oz0A
4025.4	5^+		100	0.83	130	0.77		1.0					3959	8759(5)	86Oz0A
4032.2	1^+		1000	1.6	1000	1.0							3966	8766(5)	86Oz0A
4033.4	3^+		40	0.33	60	0.67	–0.45						3967	8767(5)	86Oz0A
4034.8	3^+		60	0.49	60	1.0							3968	8769(5)	86Oz0A
4037.4	5^+		60	0.49	80	0.75		0.9	+0.1				3971	8771(5)	86Oz0A

(continued) $^{61}_{29}\mathbf{Cu}$(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
4042.7	1^+		600	0.96	600	1.0							3976	8776(5)	86Oz0A
4049.5	5^+		30	0.24	45	0.67	0.1	0.1	+0.8				3983	8783(5)	86Oz0A
4056.6	1^+		250	0.39	280	0.89	1.0						3990	8790(5)	86Oz0A
4058.4	5^+		35	0.28	70	0.50	0.3	0.6	+0.1				3991	8792(5)	86Oz0A
4068.5	1^+		200	0.31	200	1.0							4001	8802(5)	86Oz0A
4072.1	1^+		100	0.16	100	1.0							4005	8805(5)	86Oz0A
4077.5	1^+		3000	4.6	3000	1.0							4010	8811(5)	86Oz0A
4079.8	5^+		80	0.61	120	0.67	0.2	0.8					4012	8813(5)	86Oz0A
4081.3	5^+		100	0.77	110	0.91		1.0					4014	8814(5)	86Oz0A
4093.2	1^+		100	0.15	100	1.0							4026	8826(5)	86Oz0A
4095.2	1^+		1500	2.3	1500	1.0							4028	8828(5)	86Oz0A
4096.7	3^+		50	0.37	70	0.71	–0.05						4029	8830(5)	86Oz0A
4097.2	1^+		100	0.15	100	1.0							4030	8830(5)	86Oz0A
4104.1	1^+		1000	1.5	1000	1.0							4036	8837(5)	86Oz0A
4104.5	1^+		1000	1.5	1000	1.0							4037	8837(5)	86Oz0A
4107.8	3^+		60	0.44	60	1.0							4040	8840(5)	86Oz0A
4119.1	1^+		600	0.89	600	1.0							4051	8852(5)	86Oz0A
4119.7	5^+		250	1.8	300	0.83	0.1	0.6	+0.3				4052	8852(5)	86Oz0A
4121.1	3^-		60	0.15	85	0.71		1.0					4053	8854(5)	86Oz0A
4123.9	5^+		100	0.72	150	0.67	0.4	0.1	+0.5				4056	8856(5)	86Oz0A
4124.8	1^+		60	0.09	120	0.50	1.0						4057	8857(5)	86Oz0A
4129.5	3^-		60	0.15	60	1.0							4061	8862(5)	86Oz0A
4133.0	1^+		100	0.15	120	0.83	1.0						4065	8866(5)	86Oz0A
4138.9	1^-		60	0.14	60	1.0							4071	8871(5)	86Oz0A
4140.3	5^+		50	0.35	100	0.50	0.4	0.4	–0.2				4072	8872(5)	86Oz0A
4143.2	1^-		250	0.60	250	1.0							4075	8875(5)	86Oz0A
4144.3	3^+		200	1.4	200	1.0							4076	8876(5)	86Oz0A
4148.0	5^+		100	0.70	120	0.83	0.7	0.2	–0.1				4080	8880(5)	86Oz0A
4149.4	1^+		600	0.86	600	1.0							4081	8881(5)	86Oz0A
4151.8	5^+		30	0.21	45	0.67		0.9	+0.1				4083	8884(5)	86Oz0A
4155.2	5^+		100	0.69	115	0.87	0.6		0.4				4087	8887(5)	86Oz0A
4158.0	1^+		1500	2.1	1500	1.0							4090	8890(5)	86Oz0A
4162.5	3^+		60	0.41	80	0.75	–0.6						4094	8894(5)	86Oz0A
4168.0	1^+		400	0.56	400	1.0							4100	8900(5)	86Oz0A
4169.9	3^+		200	1.4	200	1.0							4101	8902(5)	86Oz0A
4173.8	1^+		600	0.84	600	1.0							4105	8905(5)	86Oz0A
4174.6	5^+		250	1.7	500	0.50	0.1	0.9					4106	8906(5)	86Oz0A
4181.5	5^+		80	0.55	160	0.50	0.2		0.8				4113	8913(5)	86Oz0A
4182.3	1^+		200	0.28	200	1.0							4113	8914(5)	86Oz0A
4183.1	1^-		200	0.46	240	0.83	1.0						4114	8915(5)	86Oz0A
4185.9	3^+		150	0.99	150	1.0							4117	8917(5)	86Oz0A
4188.2	5^+		50	0.33	100	0.50	0.2	0.7	–0.1				4119	8920(5)	86Oz0A
4193.7	1^+		100	0.14	100	1.0							4125	8925(5)	86Oz0A
4194.3	5^+		150	0.98	175	0.86		0.6	+0.4				4125	8926(5)	86Oz0A
4197.1	5^+		30	0.20	50	0.60	0.2		0.8				4128	8928(5)	86Oz0A

(continued) **$^{61}_{29}$Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
4203.8	3^+		150	0.97	200	0.75	0.45						4134	8935(5)	86Oz0A
4209.0	1^+		800	1.1	900	0.89	1.0						4140	8940(5)	86Oz0A
4211.6	1^-		100	0.22	120	0.83	1.0						4142	8943(5)	86Oz0A
4213.5	5^+		60	0.38	80	0.75	0.4	0.4	+0.2				4144	8944(5)	86Oz0A
4220.3	1^+		3000	3.9	3000	1.0							4151	8951(5)	86Oz0A
4220.9	3^+		150	0.92	175	0.86	0.5						4151	8952(5)	86Oz0A
4223.7	5^+		60	0.37	70	0.86		0.8	+0.2				4154	8954(5)	86Oz0A
4226.0	3^+		100	0.61	180	0.56	0.1						4157	8957(5)	86Oz0A
4227.1	5^+		120	0.73	145	0.83	0.2	0.7	+0.1				4157	8958(5)	86Oz0A
4230.9	3^-		300	0.64	300	1.0							4161	8962(5)	86Oz0A
4234.3	3^+		60	0.36	60	1.0							4164	8965(5)	86Oz0A
4238.2	5^+		150	0.90	250	0.60	0.1	0.9					4168	8969(5)	86Oz0A
4239.0	3^-		100	0.21	140	0.71	0.1	0.9					4170	8970(5)	86Oz0A
4242.5	1^+		200	0.26	200	1.0							4173	8973(5)	86Oz0A
4243.6	3^-		250	0.52	270	0.93	0.8	0.2					4174	8974(5)	86Oz0A
4244.6	5^+		30	0.18	60	0.50		0.7	+0.3				4175	8975(5)	86Oz0A
4246.7	3^-		180	0.38	180	1.0							4177	8977(5)	86Oz0A
4249.1	5^+		500	3.0	680	0.74	0.1	0.9					4179	8979(5)	86Oz0A
4250.7	5^+		200	1.2	300	0.67	0.2	0.7	+0.1				4181	8981(5)	86Oz0A
4253.5	5^+		30	0.18	30	1.0							4183	8984(5)	86Oz0A
4258.1	5^+		50	0.29	100	0.50	0.5	0.1	+0.4				4188	8988(5)	86Oz0A
4258.9	5^+		50	0.29	100	0.50	0.3	0.1	+0.6				4189	8989(5)	86Oz0A
4259.9	1^+		800	1.0	800	1.0							4190	8990(5)	86Oz0A
4260.7	5^+		140	0.81	200	0.70	0.3	0.6	+0.1				4190	8991(5)	86Oz0A
4262.9	1^+		2500	3.2	2500	1.0							4193	8993(5)	86Oz0A
4266.5	5^+		300	1.7	340	0.88	0.2	0.6	+0.2				4196	8997(5)	86Oz0A
4267.5	5^+		35	0.20	70	0.50	0.1	0.4	+0.5				4197	8998(5)	86Oz0A
4271.4	5^+		70	0.40	100	0.70	0.5		0.5				4201	9001(5)	86Oz0A
4272.3	1^+		100	0.13	100	1.0							4202	9002(5)	86Oz0A
4273.3	3^+		210	1.2	420	0.50	0.25						4203	9003(5)	86Oz0A
4276.3	3^+		500	2.9	550	0.91	–0.5						4206	9006(5)	86Oz0A
4279.7	1^-		500	1.0	500	1.0							4209	9010(5)	86Oz0A
4282.1	5^+		400	2.3	470	0.85	0.1	0.6	+0.3				4211	9012(5)	86Oz0A
4287.3	1^+		60	0.07	60	1.0							4217	9017(5)	86Oz0A
4291.7	3^+		180	1.0	180	1.0							4221	9021(5)	86Oz0A
4294.6	1^+		100	0.12	100	1.0							4224	9024(5)	86Oz0A
4295.1	5^+		60	0.33	100	0.60	0.3	0.1	–0.6				4224	9025(5)	86Oz0A
4297.6	5^+		700	3.9	770	0.91	0.4		0.6				4227	9027(5)	86Oz0A
4301.3	5^+		100	0.55	200	0.50	0.6		0.4				4230	9031(5)	86Oz0A
4303.3	1^+		200	0.26	200	1.0							4232	9033(5)	86Oz0A
4304.1	5^+		40	0.22	65	0.62	0.1	0.8	–0.1				4233	9034(5)	86Oz0A
4305.1	1^+		300	0.36	300	1.0							4234	9035(5)	86Oz0A
4307.0	1^+		400	0.48	400	1.0							4236	9037(5)	86Oz0A
4309.7	3^+		300	1.6	400	0.75	–0.25						4239	9039(5)	86Oz0A
4310.6	5^+		180	0.98	240	0.75	0.5		0.5				4239	9040(5)	86Oz0A

(continued)

$^{61}_{29}$Cu(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
4314.1	3^-		200	0.39	200	1.0							4243	9043(5)	86Oz0A
4315.1	5^+		200	1.1	280	0.71	0.1	0.7	–0.2				4244	9044(5)	86Oz0A
4316.3	3^+		200	1.1	250	0.80	–0.6						4245	9046(5)	86Oz0A
4318.5	1^+		1000	1.2	1000	1.0							4247	9048(5)	86Oz0A
4321.0	3^-		200	0.39	200	1.0							4250	9051(5)	86Oz0A
4322.4	1^-		300	0.58	500	0.60	1.0						4251	9052(5)	86Oz0A
4324.7	3^+		180	0.96	360	0.50	–0.05						4253	9054(5)	86Oz0A
4327.0	5^+		50	0.27	100	0.50	0.4	0.5	–0.1				4256	9057(5)	86Oz0A
4332.0	5^+		100	0.53	200	0.50	0.4		0.6				4261	9061(5)	86Oz0A
4336.8	1^+		600	0.71	600	1.0							4265	9066(5)	86Oz0A
4339.5	3^-		150	0.28	230	0.65		1.0					4268	9068(5)	86Oz0A
4340.4	1^+		150	0.18	150	1.0							4269	9069(5)	86Oz0A
4343.4	1^-		450	0.85	450	1.0							4272	9072(5)	86Oz0A
4344.6	3^-		100	0.19	200	0.5		1.0					4273	9073(5)	86Oz0A
4349.3	5^+		100	0.52	190	0.53	0.3		0.7				4278	9078(5)	86Oz0A
4350.3	3^-		60	0.11	90	0.67	0.2	0.8					4279	9079(5)	86Oz0A
4354.7	1^+		250	0.29	250	1.0							4283	9083(5)	86Oz0A
4357.0	5^+		150	0.77	150	1.0							4286	9086(5)	86Oz0A
4359.0	5^+		30	0.15	30	1.0							4288	9088(5)	86Oz0A
4363.3	1^+		400	0.46	400	1.0							4291	9092(5)	86Oz0A
4366.4	5^+		100	0.51	200	0.50	0.4	0.1	+0.5				4294	9095(5)	86Oz0A
4371.9	5^+		30	0.15	30	1.0							4300	9100(5)	86Oz0A
4375.7	1^+		100	0.11	100	1.0							4304	9104(5)	86Oz0A
4376.8	3^+		180	0.90	300	0.60	0.1						4305	9105(5)	86Oz0A
4378.7	3^+		300	1.5	400	0.75	0.0						4306	9107(5)	86Oz0A
4381.7	1^+		400	0.45	400	1.0							4309	9110(5)	86Oz0A
4382.1	5^+		60	0.30	85	0.71	0.5		0.5				4310	9110(5)	86Oz0A
4383.9	1^+		60	0.07	60	1.0							4312	9112(5)	86Oz0A
4386.1	1^+		2500	2.8	2500	1.0							4314	9114(5)	86Oz0A
4388.6	5^+		30	0.15	50	0.60	0.3	0.5	–0.2				4316	9117(5)	86Oz0A
4391.3	5^+		30	0.15	55	0.55	0.3		0.7				4319	9119(5)	86Oz0A
4393.1	3^-		80	0.14	160	0.5		1.0					4321	9121(5)	86Oz0A
4395.9	5^-		10	0.24	10	1.0							4323	9124(5)	86Oz0A
4398.4	3^+		80	0.39	160	0.50	0.05						4326	9126(5)	86Oz0A
4400.0	1^+		2000	2.2	2100	0.95	1.0						4328	9128(5)	86Oz0A
4400.2	5^+		240	1.2	440	0.55	0.2	0.2	+0.6				4328	9128(5)	86Oz0A
4402.1	5^+		50	0.24	100	0.50	0.3	0.6	–0.1				4329	9130(5)	86Oz0A
4404.2	5^+		100	0.48	100	1.0							4332	9132(5)	86Oz0A
4406.0	1^+		3500	3.9	4100	0.85	1.0						4334	9134(5)	86Oz0A
4409.6	5^+		60	0.29	90	0.67	0.4	0.1	+0.5				4337	9137(5)	86Oz0A
4412.2	1^+		2500	2.8	2500	1.0							4339	9140(5)	86Oz0A
4419.6	3^+		110	0.52	220	0.50	0.5						4347	9147(5)	86Oz0A
4436.3	5^+		40	0.19	60	0.67	0.2	0.7	+0.1				4363	9164(5)	86Oz0A
4437.8	1^+		5500	6.0	6000	0.92	1.0						4365	9165(5)	86Oz0A
4439.4	1^+		2000	2.2	2200	0.91	1.0						4366	9167(5)	86Oz0A

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
4445.7	1^+		300	0.32	300	1.0							4372	9173(5)	86Oz0A
4446.3	3^-		50	0.09	80	0.63		1.0					4373	9173(5)	86Oz0A
4452.5	5^+		40	0.18	75	0.53	0.6	0.2	+0.2				4379	9179(5)	86Oz0A
4455.9	1^+		400	0.43	400	1.0							4382	9183(5)	86Oz0A
4461.0	1^-		100	0.17	100	1.0							4388	9188(5)	86Oz0A
4462.7	5^+		200	0.90	200	1.0							4389	9190(5)	86Oz0A
4466.2	3^+		300	1.3	350	0.86	0.1						4393	9193(5)	86Oz0A
4469.3	1^+		300	0.32	300	1.0							4396	9196(5)	86Oz0A
4470.5	3^+		265	0.67	300	0.89	0.2						4397	9197(5)	86Oz0A
4472.3	1^-		200	0.35	400	0.50	1.0						4399	9199(5)	86Oz0A
4474.3	1^+		300	0.31	550	0.55	1.0						4401	9201(5)	86Oz0A
4477.1	1^-		150	0.25	150	1.0							4403	9204(5)	86Oz0A
4478.9	5^+		85	0.37	170	0.50	0.3	0.6	–0.1				4405	9205(5)	86Oz0A
4481.5	5^+		120	0.53	200	0.60	0.4	0.1	+0.5				4408	9208(5)	86Oz0A
4487.7	3^+		55	0.24	110	0.50	–0.15						4414	9214(5)	86Oz0A
4491.6	1^-		200	0.35	200	1.0							4418	9218(5)	86Oz0A
4494.4	5^+		80	0.35	80	1.0							4420	9221(5)	86Oz0A
4501.0	1^+		400	0.41	400	1.0							4427	9228(5)	86Oz0A
4503.3	5^+		60	0.26	105	0.57	0.5		0.5				4429	9229(5)	86Oz0A
4505.0	3^+		180	0.77	260	0.69	–0.1						4431	9232(5)	86Oz0A
4508.4	1^+		250	0.25	410	0.61	1.0						4434	9234(5)	86Oz0A
4511.6	3^+		280	1.2	560	0.50	–0.05						4437	9238(5)	86Oz0A
4512.7	1^-		110	0.18	220	0.50	1.0						4438	9239(5)	86Oz0A
4514.6	5^+		30	0.13	50	0.60	0.3		0.7				4440	9241(5)	86Oz0A
4515.1	3^-		150	0.24	180	0.83		1.0					4441	9241(5)	86Oz0A
4517.2	3^-		160	0.25	320	0.50	0.9	0.1					4443	9243(5)	86Oz0A
4520.0	1^-		100	0.16	150	0.67	1.0						4446	9246(5)	86Oz0A
4521.0	5^+		50	0.21	50	1.0							4447	9247(5)	86Oz0A
4524.8	1^-		150	0.24	150	1.0							4450	9251(5)	86Oz0A
4526.9	5^+		70	0.29	120	0.58	0.2	0.7	+0.1				4452	9253(5)	86Oz0A
4529.6	1^+		300	0.30	480	0.63	1.0						4455	9255(5)	86Oz0A
4531.2	5^+		170	0.70	240	0.71		0.9	–0.1				4456	9257(5)	86Oz0A
4535.5	5^+		40	0.16	80	0.50		1.0					4461	9261(5)	86Oz0A
4537.6	5^+		50	0.21	80	0.63	0.3		0.7				4463	9263(5)	86Oz0A
4538.5	1^-		150	0.23	150	1.0							4464	9264(5)	86Oz0A
4542.4	5^+		30	0.12	30	1.0							4467	9268(5)	86Oz0A
4547.8	3^+		60	0.24	60	1.0							4473	9273(5)	86Oz0A
4549.6	1^+		200	0.20	200	1.0							4475	9275(5)	86Oz0A
4552.1	5^+		180	0.73	180	1.0							4477	9277(5)	86Oz0A
4554.7	5^+		30	0.12	55	0.55	0.4	0.5	–0.1				4480	9280(5)	86Oz0A
4557.8	5^+		110	0.44	220	0.50		0.9	+0.1				4483	9283(5)	86Oz0A
4564.0	5^+		85	0.34	170	0.50	0.3		0.7				4489	9290(5)	86Oz0A
4564.9	3^-		80	0.12	80	1.0							4490	9290(5)	86Oz0A
4572.6	3^+		45	0.18	90	0.50	0.1						4497	9298(5)	86Oz0A
4574.2	1^+		1500	1.5	1500	1.0							4499	9299(5)	86Oz0A

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ^2_p [keV]	Γ [eV]	Γ_p/Γ	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	$\alpha^2_{s\ell}$	Γ_γ [eV]	$S_{\mathrm{p}\gamma}$ [meV]	E^*_analog [keV]	E_cm [keV]	E^* [keV]	Ref.
4575.6	5^+		60	0.24	120	0.50		1.0					4500	9301(5)	86Oz0A
4577.1	5^+		150	0.59	200	0.75	0.2	0.1	+0.7				4502	9302(5)	86Oz0A
4577.2	1^+		200	0.19	200	1.0							4502	9302(5)	86Oz0A
4580.0	5^+		80	0.31	110	0.73	0.2	0.1	+0.7				4505	9305(5)	86Oz0A
4580.8	5^+		170	0.66	200	0.85		0.9	+0.1				4505	9306(5)	86Oz0A
4583.6	3^-		100	0.15	120	0.83	0.5	0.5					4508	9308(5)	86Oz0A
4585.6	3^+		350	1.4	530	0.66	0.5						4510	9310(5)	86Oz0A
4587.2	5^+		80	0.31	150	0.53	0.2	0.2	+0.4				4512	9312(5)	86Oz0A
4590.1	1^+		300	0.29	300	1.0							4514	9315(5)	86Oz0A
4592.3	1^+		800	0.76	800	1.0							4517	9317(5)	86Oz0A
4593.4	5^+		100	0.39	190	0.53		0.6	+0.4				4518	9318(5)	86Oz0A
4596.1	5^+		40	0.15	75	0.53	0.2	0.1	+0.7				4520	9321(5)	86Oz0A
4597.3	3^+		300	1.2	350	0.86	0.05						4521	9322(5)	86Oz0A
4600.9	5^+		50	0.19	100	0.50	0.2	0.2	+0.6				4525	9325(5)	86Oz0A
4602.8	3^+		110	0.42	220	0.50	0.25						4527	9327(5)	86Oz0A
4604.7	5^+		80	0.30	150	0.53	0.3		0.7				4529	9329(5)	86Oz0A
4605.7	1^+		1500	1.4	1500	1.0							4530	9330(5)	86Oz0A
4609.2	5^+		60	0.23	85	0.71		0.6	–0.4				4533	9334(5)	86Oz0A
4612.6	3^+		400	1.5	800	0.50	0.4						4537	9337(5)	86Oz0A
4615.3	1^+		300	0.28	430	0.70	1.0						4539	9340(5)	86Oz0A
4616.1	1^+		150	0.14	200	0.75	1.0						4540	9340(5)	86Oz0A
4623.1	5^+		70	0.26	115	0.61	0.1	0.7	+0.2				4547	9347(5)	86Oz0A
4624.5	1^+		250	0.28	300	0.83	1.0						4548	9349(5)	86Oz0A
4627.5	5^+		80	0.30	110	0.73	0.4	0.1	–0.5				4551	9352(5)	86Oz0A
4629.8	5^+		45	0.17	90	0.50		0.8	+0.2				4553	9354(5)	86Oz0A
4635.4	5^+		120	0.44	240	0.50	0.3	0.1	–0.6				4559	9359(5)	86Oz0A
4636.6	1^+		500	0.46	780	0.64	1.0						4560	9361(5)	86Oz0A
4642.4	5^+		30	0.11	60	0.50	0.1	0.2	+0.7				4566	9366(5)	86Oz0A
4644.3	5^+		95	0.35	190	0.50	0.3	0.1	–0.6				4568	9368(5)	86Oz0A
4645.9	3^-		65	0.09	130	0.50		1.0					4569	9370(5)	86Oz0A
4647.9	5^+		90	0.33	180	0.50	0.2	0.4	+0.4				4571	9372(5)	86Oz0A
4655.1	1^+		1200	1.1	1200	1.0							4578	9379(5)	86Oz0A
4656.5	3^+		250	0.90	300	0.83	0.0						4580	9380(5)	86Oz0A
4659.6	1^-		100	0.14	200	0.50	1.0						4583	9383(5)	86Oz0A
4660.0	1^+		3000	2.7	3500	0.86	1.0					3086	4584	9384(5)	69Gu07 86Oz0A
4664.3	5^+		60	0.21	60	1.0							4587	9388(5)	86Oz0A
4669.5	5^+		150	0.53	190	0.79		0.9	–0.1				4593	9393(5)	86Oz0A
4672.1	1^+		9000	8.1	9500	0.95	1.0						4595	9395(5)	86Oz0A
4674.0	5^+		100	0.35	100	1.0							4597	9398(5)	86Oz0A
4679.7	3^-		120	0.16	160	0.75		1.0					4603	9403(5)	86Oz0A
4681.3	5^+		80	0.28	125	0.64		0.6	+0.4				4604	9405(5)	86Oz0A
4682.2	3^-		60	0.08	105	0.57		1.0					4605	9405(5)	86Oz0A
4683.3	1^-		200	0.27	200	1.0							4606	9407(5)	86Oz0A
4686.5	3^+		220	0.76	370	0.59	0.3						4609	9410(5)	86Oz0A
4690.8	5^+		120	0.42	145	0.83		0.7	+0.3				4613	9414(5)	86Oz0A

(continued) $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [eV]	Γ_p/Γ	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	$\alpha_{s\ell}^2$	Γ_γ [eV]	$S_{p\gamma}$ [meV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
4692.2	1^+		300	0.27	300	1.0							4615	9415(5)	86Oz0A
4693.1	1^+		300	0.27	300	1.0							4616	9416(5)	86Oz0A
4695.2	3^+		100	0.34	100	1.0							4618	9418(5)	86Oz0A
4697.4	3^+		100	0.34	180	0.56	0.5						4620	9420(5)	86Oz0A
4698.7	1^+		200	0.18	240	0.83	1.0						4621	9422(5)	86Oz0A
4700.6	1^+		300	0.26	360	0.83	1.0						4623	9424(5)	86Oz0A
4702.2	1^+		600	0.53	700	0.86	1.0						4625	9425(5)	86Oz0A
4704.3	3^-		150	0.20	300	0.50		1.0					4627	9427(5)	86Oz0A
4705.0	1^+		300	0.26	350	0.86	1.0						4628	9428(5)	86Oz0A
4708.3	5^+		60	0.20	60	1.0							4631	9431(5)	86Oz0A
4709.9	5^+		120	0.41	240	0.50	0.4	0.1	+0.5				4632	9433(5)	86Oz0A
4714.0	1^+		300	0.26	300	1.0							4637	9437(5)	86Oz0A
4720.5	3^+		150	0.50	150	1.0							4643	9443(5)	86Oz0A
4721.5	5^+		140	0.47	205	0.68	0.2	0.2	+0.6				4644	9444(5)	86Oz0A
4724.4	1^+		1200	1.0	1200	1.0							4647	9447(5)	86Oz0A
4728.5	3^+		250	0.83	250	1.0							4651	9451(5)	86Oz0A
4731.0	5^+		140	0.46	280	0.50		0.9	–0.1				4653	9454(5)	86Oz0A
4732.4	5^+		110	0.36	220	0.50	0.4		0.6				4654	9455(5)	86Oz0A
4745.0	3^+		150	0.49	150	1.0							4667	9468(5)	86Oz0A
5077	3^+,5^+											3494	4994	9794(5)	69Gu07
5334	1^+											3746	5247	1004(5)	69Gu07
5445	3^+,5^+											3876	5356	1015(5)	69Gu07

Additional data on this isotope can be found in [99Bh04, 89Iz01, 88Iz01, 88Iz02, 87IzZY, 86IzZZ, 79Fi02, 76Ar0A, 76Be30, 76Bo06, 76Kr19, 75Kr05, 75Na19, 74Ad06, 74Be72, 74Kr0A, 74Kr26, 73Tr06, 72Sz01, 71Ki29].

* Downwards shift of 8 keV is made in $E_\circ$ of these 11 resonances [90Sz01] to fit the energy scale of [92Ho01] and [90Sz01] to that of [76Ar0A, 86Oz0A].

** For resonances at $E_\circ$<2 MeV γ-rays yield (in γ quanta per μCoulomb) is given instead of Γ.

*** For this resonance parameters of the inelastic scattering are given in [76FlZY].

Parameters $\alpha_{s\ell}^2$ describe the results of measurements of inelastic proton scattering [86Oz0A].

For resonances with $E_\circ$=3720–3729 keV $g\Gamma_\gamma$ [92Ho01] are given instead of Γ_γ.

Uncertainties for $E_\circ$<4 MeV are estimated as 3 keV [76Ar0A] and for $E_\circ$>4 keV as 5 keV [86Oz0A].

Branching ratios of γ-transitions [02Nu0A, 90Sz01, 76Be30, 74Tr03]. Part 1. $^{61}_{29}$**Cu**(p)

E^*	$2J^\pi$	$E_\circ$	Branching ratios										$\Gamma_{p'}$	$\gamma^2_{p'}$	Γ_{AA1}	Γ_{AA2}	Ref.
[keV]		[keV]	Percentage										[eV]	[keV]	[meV]	[meV]	
E^*			0	475	970	1311	1394	1660	1733	1904	1933	1942					
$2J^\pi_f$			3^-	1^-	5^-	7^-	5^-	3^-	7^-	5^-	3^-	7^-					
475.10(8)	1^-		100														74Kr26
970.06(7)	5^-		100														74Kr26
1310.54(9)	7^-		100														74Kr26
1394.20(10)	5^-		91	8	1												74Kr26
1660.46(11)	3^-		61	22	17												74Kr26
1732.60(10)	7^-		70			30											74Kr26
1904.18(14)	5^-		27		36	37											74Kr26
1932.66(16)	3^-		100														74Kr26
1942.48(12)	7^-																
2088.86(9)	$\langle 1\rangle^-$		61	39													71Ki29
2203.42(12)	5^-				73	27											74Kr26
2295.10(11)	9^-																
2336.47(18)	9^-																
2358.19(12)	3^-		36	30				14			20						74Kr26
2399.02(23)	7^-																
2472.46(22)	3^-			70	30												74Kr26
2583.75(23)	5^+,5^-		74						26								74Kr26
2584.6(5)	3,5																
2611.72(14)	9^-																
2627.15(20)	11^-																
2684.12(21)	3^-		46	54													74Kr26
2720.71(16)	9^+																
2728.34(19)	7^-																
2792.63(13)	5^-		60			40											74Kr26
2840.49(14)	1^-,3^-																
2857.1(3)	1^-,3^-		100														71Ki29
2924.2(4)	X^-																
2932.74(17)	3^-																
3001.61(18)	5		100														74Kr26
3015.72(17)	11^-																
3019.3(11)	3^-		13	87													74Kr26
3037(15)																	
3041.6			38	62													74Kr26
3065.54(21)	3^-		100														74Kr26
3092.1(5)	3^-		100														74Kr26
3198.58(23)																	
3249(15)																	
3259.78(24)	$11^{\langle -\rangle}$																
3277.1(10)	7^+,7^+		100														74Tr03
3790.1(10)					30												74Tr03
3802(7)																	
3844(7)	1^+																

(continued) $^{61}_{29}\mathbf{Cu}(\mathrm{p})$

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage										$\Gamma_{\mathrm{p}'}$ [eV]	$\gamma^2_{\mathrm{p}'}$ [keV]	Γ_{AA1} [meV]	Γ_{AA2} [meV]	Ref.
E^*			0	475	970	1311	1394	1660	1733	1904	1933	1942					
$2J^\pi_\mathrm{f}$			3^-	1^-	5^-	7^-	5^-	3^-	7^-	5^-	3^-	7^-					
3853.1																	
3863	1^-,3^-																
3942.8	11^+																
3947				60			20										74Tr03
6351(3)	3	1577	x	x	x			x									73Tr06
6362(3)	[3^-]	1588	21	3	8		19	<1									73Tr06
6372(3)	[3^-]	1599	24	11	11		18	3									73Tr06
6378(3)	[3^-]	1605	54	9	5		15	1									73Tr06
6393(3)	[3^-]	1620	54		1		18	<1		1							73Tr06
6418.3*																	
6431*		1656	70	22													73Tr06
6441(3)	5	1668	68		12	8	5					4					73Tr06
6446(3)	[5^-]	1674			14	36	5		1		1	1					73Tr06
6457(4)		1685	60		8	32											73Tr06
6467*		1694	52	27	11			4									73Tr06
6627		1850	66		5	1	15		3								73Tr06
6629.8	[1^-]	1858	11	35				3			2						74Tr03
6644.5	[1^-]	1876	34														73Tr06
6681*		1910	28	9	1			2		5	9						73Tr06
7014*		2248	15	7	3		22				4	2					74Tr03
7029*		2263	26		10	4	2	17	9	3	9						74Tr03
7046*		2279	53	2				8									74Tr03
8431*	⟨5^+⟩	3694	65(3)			35											76Be30
8436*	[1,3]	3700	14(4)	86(4)													76Be30
8439*	3^+	3703	27(5)	36(10)			12(6)	25(6)									76Be30
8442*	5^+	3706	18(4)		82(4)												76Be30
8446	9^+	3702				23						9	0.8	0.13	56	2	90Sz01
8449*	[1,2]	3709	76(5)	24(5)													76Be30
8450	9^+	3706											3.7	0.59	142	34	90Sz01
8453	9^+	3709							12			5	1.1	0.17	62	18	90Sz01
8456*	[5^+]	3716			100												76Be30
8457*	[1,3]	3721	26(4)	32(4)							42						76Be30
8457	9^+	3713				11			22			4	0.9	9.6	61	5	90Sz01
8463	9^+	3720				2			1			1	10.1	1.54	486	75	90Sz01
8465	9^+	3721				2			1				10.6	1.62	393	52	90Sz01
8465.8	[5^+]	3726	34(5)			43				23							76Be30
8469.1	[1^-]	3730	100														76Be30
8472	9^+	3729				4						3	2.7	0.41	284	50	90Sz01
8475	9^+	3731				11						3	0.1	0.02	107	16	90Sz01
8477	9^+	3734				3			2			2	2.8	0.41	328	21	90Sz01
8478.2	[1^-]	3739	85(4)	15(4)													76Be30
8480	9^+	3736				4							3.4	0.50	119	7	90Sz01

(continued) $^{61}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage										$\Gamma_{p'}$ [eV]	$\gamma^2_{p'}$ [keV]	Γ_{AA1} [meV]	Γ_{AA2} [meV]	Ref.
E^*			0	475	970	1311	1394	1660	1733	1904	1933	1942					
$2J^\pi_f$			3^-	1^-	5^-	7^-	5^-	3^-	7^-	5^-	3^-	7^-					
8482.4	[1^+]	3743	52(5)	15(5)				33(4)									76Be30
8484	9^+	3740				5			9			7	4.3	0.62	208	29	90Sz01
8487.2	[1^+]	3748	33(4)	27(4)	22(4)	18(4)											76Be30
8494.7	[1^+]	3756	39(4)			25(4)			36(4)								76Be30
8498.2	[3^-]	3759	100														76Be30
8503.2	[5^+]	3764	100														76Be30
8505.5	[5^+]	3767	43(6)	12(5)				25(6)		20(7)							76Be30
8517.1	[1^+]	3779	71(4)			5(3)		5(2)			10(2)						76Be30
8527.6	[1^+]	3789		100													76Be30
8539.5	[1^+]	3801	65(5)	35(5)													76Be30

* introduced in [90Sz01, 76Be30, 74Tr03, 73Tr06, 89Ti01]; not included in [02Nu0A]
Partial widths of transitions from IAR at E^*=8460 keV can be found in [90Sz01].
Strong M1 transitions to the so-called antianalog states were discussed in [90Sz01].

Branching ratios of γ-transitions [02Nu0A, 90Sz01, 76Be30, 74Tr03, 73Tr06]. Part 2. $^{61}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^*			2088	2203	2296	2336	2358	2399	2476	2584	2612	2627	2684	2720	2727
$2J^\pi_f$			5^-	9^-	7^-	7,11	9^+	X^-	1^-,3^-	9^+			3^-		
6350.6(25)	3	1577					x								
6361.5(25)	[3^-]	1588	6				5		8	<1					
6372.3(25)	[3^-]	1599	5	5					3	3					
6378.2(25)	[3^-]	1605	4						2	2					
6392.9(25)	[3^-]	1620	8												
6431*		1656	2				5		1						
6441.0(25)	5	1668							3						
6446.1(25)	[5^-]	1674		18					10						13
6467*		1694								2					
6627		1850		2			2	2							
	[1^-]	1858					3								
6645	[1^-]	1876	10						15						
6681*		1910					7		11						
7014*		2248	5	5			3		1				4		
7029*		2263					4		4						
7046*		2279	6				3		1						
8446	9^+	3702						17						43	

(continued) $^{61}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^* / $2J^\pi_f$			2088 5^-	2203 9^-	2296 7^-	2336 7,11	2358 9^+	2399 X^-	2476 1^-,3^-	2584 9^+	2612	2627	2684 3^-	2720	2727
8450	9^+	3706			5			6				2		53	
8453	9^+	3709			4	6		12			3			29	
8457	9^+	3713			2	14		7						30	
8463	9^+	3720			1	3		2						64	
8465	9^+	3721				10								64	
8472	9^+	3729			3	5		4						62	
8475	9^+	3731			3	6		6			3			50	
8477	9^+	3734			2	2		3			3	6		67	
8480	9^+	3736										8		78	
8484	9^+	3740			1	2						2		55	
8517.1	[1^+]	3779		9(2)											

* not included in [02Nu0A], introduced from data in [90Sz01, 76Be30, 74Tr03, 73Tr06]

Branching ratios of γ-transitions [02Nu0A, 90Sz01, 76Be30, 74Tr03, 73Tr06]. Part 3. $^{61}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage												
E^* / $2J^\pi_f$			2792	2842	2856	2932	3004	3016	3020	3066	3090	3260	3277	3358	3406
6361.5(25)	[3^-]	1588			6				8						[6]
6372.3(25)	[3^-]	1599							2						
6378.2(25)	[3^-]	1605	2	1											
6392.9(25)	[3^-]	1620		<1	4				1	<1	3				
6446.1(25)	[5^-]	1674					1			1					
6467*		1694	2												
6627		1850								2		1			
	[1^-]	1858		2					2	8	6		2		
6645	[1^-]	1876		9	8					6			18		
6681*		1910		1	4	10				3	8				
7014*		2248	3		5	10				5			2		
7029*		2263	4		2		3		3						
7046*		2279		<1					5		8		2	7	
8450	9^+	3706						9							
8453	9^+	3709						8							
8457	9^+	3713										4			
8463	9^+	3720						8							
8465	9^+	3721						8							

(continued) $^{61}_{29}$**Cu**(p)

E^* [keV]	$2J^{\pi}$	$E_{\circ}$ [keV]	Branching ratios Percentage												
E^* $2J^{\pi}_{\mathrm{f}}$			2792	2842	2856	2932	3004	3016	3020	3066	3090	3260	3277	3358	3406
8472	9^+	3729					2	2							
8475	9^+	3731					2								
8477	9^+	3734						2							
8480	9^+	3736						2							
8484	9^+	3740					4	3							

* not included in [02Nu0A], introduced from data in [90Sz01, 76Be30, 74Tr03, 73Tr06]

Branching ratios of γ-transitions [02Nu0A, 90Sz01, 76Be30, 74Tr03, 73Tr06]. Part 4. $^{61}_{29}$**Cu**(p)

E^* [keV]	$2J^{\pi}$	$E_{\circ}$ [keV]	Branching ratios Percentage													Ref.
E^* $2J^{\pi}_{\mathrm{f}}$			3437	3521	3590	3706	3740	3790	3947	3980	4133	4332	4381	5121	5251	
6361.5(25)	[3^-]	1588				5	[5]									
6372.3(25)	[3^-]	1599	[7]	2		3	[3]									
6378.2(25)	[3^-]	1605		3												
6392.9(25)	[3^-]	1620	[1]	1		5	[2]									
	[1^-]	1858			7		[2]	9	7							74Tr03
6681*		1910	[2]													
8446	9^+	3702									1	7				
8450	9^+	3706								1	13			4	7	
8453	9^+	3709								3	8			7	4	
8457	9^+	3713									2			3	1	
8463	9^+	3720								2	10	2	1	1	2	
8465	9^+	3721								1	9	3			2	
8472	9^+	3729									11	1			3	
8475	9^+	3731									8			5	3	
8477	9^+	3734								2	4			1	1	
8478.2	[1^-]	3739														
8480	9^+	3736								1	4	1		2		
8482.4	[1^+]	3743														
8484	9^+	3740								1	8		2		1	

* not included in [02Nu0A], introduced from data in [90Sz01, 76Be30, 74Tr03, 73Tr06]

Parameters of radiative transitions from ℓ=0 resonances [79Bo09]. $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	Γ_γ [eV]	Partial radiative widths [eV]														
E^*			0	475	1660	1933	2089	2358	2473	2684	2840	2933	3019	3066	3277	3358	3437
$2J^\pi_\mathrm{f}$			3^-	1^-	3^-	3^-	1^-	3^-	3^-	3^-	1^-3^-	3^-	3^-	3^-	7^+9^+		
1814	1^+	1.26	29		164	70		135	182			513	706				
2036	1^+	0.63	168	21	183	57	102						203				
2276	1^+3^+	4.6	8181	289	2556	1020	3411		424				6275	6086	3090	11154	
2346	$\langle 1^+\rangle$	2.28	145	1159	742	277	116	961				1308			587	679	
2464	1^+	0.46	91	68	22	83		61	38			108	159	146			
2504	1^+	5.5	10088	309	2298	1063	254	999	995	3694			850		1652	2091	
2525	1^+	4.60	8007	623	2077	557	165		1064	985	771		297	930	2573		4940
mean			3816	353	1149	447	580	329	377	770	221	456	1202	1160	1142	2078	833

Given here reduced widths are from [79Bo09] where they are represented as $\Gamma^*_{\lambda,\gamma f}=\Gamma_{\lambda,\gamma f}/E^3_\gamma$ measured in units 10^{-6}eV/MeV^3.

Parameters of radiative transitions from analog resonances [74Kr26, 75Kr05, 76Kr19]. Part 1. $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	E^* [keV]	$2J^\pi$	Partial radiative widths [meV]														Com.	Ref.
E^*			0	476	970	1310	1395	1662	1732	1904	1932	2089	2203	2358	2473	2584		
$2J^\pi_\mathrm{f}$			3^-	1^-	5^-	7^-	5^-	3^-	7^-	$\langle 5^-\rangle$	3^-	1^-	5^-	3^-	3^-	5		
1588		3^-	37	8	15		40					11		15	13	15		74Kr26
1599	6375	3^-	168	116	74		146	8				58	50		30	40		74Kr26
		3^-	177	83	64		129					46	51		26	39		76Kr19
1605	6380	3^-	259	54	28		101	15		20		39			19			74Kr26
		3^-	290		28		100					35			20			
1620	6396	3^-	251	$\leq$12	27		98	6		13		65		10				74Kr26
		3^-	270		26		92					52		14.7				
1674	6449	5^-	7	3.5	10	54	3	7	7				40		27			75Kr05
		5^-	5.6		10	49	3						45		21			
1856	6624	1^-	40	142	22			7			15	8		16				75Kr05
1873	6642	1^-	40	10								12			30			75Kr05

Values Γ_γ(E2), B(E2), Γ_γ(M1) and B(M1) for two possible combinations of these parameters from the measured angular correlation between gammas can be found in [76Kr19].

Parameters of radiative transitions from analog resonances [74Kr26, 75Kr05, 76Kr19]. Part 2. $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	E^* [keV]	$2J^\pi$	Partial radiative widths [meV]														Ref.
E^*			2687	2728	2792	2840	2859	2933	2999	3002	3022	3035	3042	3062	3094	3275	
$2J^\pi_f$			3^-		5^-	$\langle 1^- \rangle$	$\langle X \rangle^-$	3^-	$\langle$1-7$\rangle$		$\langle X \rangle^-$						
1588		3^-	16				27		4		30		8	19	8		74Kr26
1599	6375	3^-	28				23				17			17	28		74Kr26
		3^-	27				19				14.8			14.8	25		76Kr19
1605	6380	3^-			23												74Kr26
		3^-			22												
1620	6396	3^-	19				53		25		23			12	25		74Kr26
		3^-	17.5				47										
1674	6449	5^-		14						10				11			75Kr05
		5^-								14				13			
1856	6624	1^-	14			18		14			28	8		34	32		75Kr05
1873	6642	1^-				26	25	16						16		25	75Kr05

Parameters of γ-transitions from resonances with J^π=3/2$^-$ [81By03, 88Iz01]. $^{61}_{29}$**Cu**(p)

$E_\circ$ [keV]	Com.	Mixing parameter E2/M1									
E^*		0	475	970	1395	1663	2088	2203	2357	2473	2684
$2J^\pi_f$		3^-	1^-	5^-	5^-	3^-	1^-	5^-	3^-	3^-	3^-
1577	A_2	–0.35(9)	–0.44(8)			–0.4(1)					
	δ	+0.6(1)	+0.05(5)			+0.7(2)					
1588	A_2	+0.18(5)		–0.26(14)	–0.31(7)		–0.59(22)		–0.15(21)	+0.12(9)	+0.33(22)
	δ	+0.15(3)		–0.13(11)	–0.17(7)		0.06(6)		+0.37(20)	+0.18(6)	+0.05(14)
1599	A_2	+0.10(1)	–0.8(1)	–0.30(8)	–0.25(6)		–0.50(8)	0.05(20)		–0.29(9)	–0.09(15)
	δ	+0.20(1)	+0.2(1)	–0.17(7)	–0.13(4)		0.00(4)	0.04(30)		+0.50(10)	+0.30(10)
1605	A_2	+0.22(6)		–0.13(11)	–0.12(6)		–0.45(2)			+0.09(18)	
	δ	+0.10(2)		–0.03(10)	0.00(5)		–0.03(1)			+0.29(10)	
1620	A_2	+0.14(2)		–0.09(26)	–0.12(14)		–0.50(16)		+0.64(13)		–0.16(19)
	δ	+0.16(1)		0.00(22)	0.00(10)		0.00(10)		–0.16(10)		+0.40(15)
1694	A_2	+0.29(4)	–0.52(7)	–0.19(10)		+0.1(1)					
	δ	+0.07(2)	+0.01(4)	–0.07(8)		+0.17(8)					
1734	A_2	–0.31(6)	–0.6(2)	+0.80(17)	–0.04(19)	–0.1(2)					
	δ	+0.51(6)	+0.1(1)	+0.16(18)	–0.06(16)	+0.4(2)					
1764	A_2	+0.09(5)	+0.2(1)			+0.3(1)					
	δ	+0.19(3)	+0.39(4)			+0.08(6)					
1770	A_2	+0.37(4)	+0.6(1)			–0.09(9)					
	δ	+0.02(2)	+0.08(7)			+0.32(7)					
1793	A_2	+0.1(1)	–0.3(1)								

(continued) **$^{61}_{29}$Cu**(p)

$E_\circ$ [keV]	Com.	Mixing parameter E2/M1									
E^*		0	475	970	1395	1663	2088	2203	2357	2473	2684
$2J^\pi_\mathrm{f}$		3^-	1^-	5^-	5^-	3^-	1^-	5^-	3^-	3^-	3^-
	δ	+0.23(8)	–0.14(7)								
1835	A_2	+0.10(8)			–0.27(10)			–0.65(40)	+0.22(13)		
	δ	+0.19(5)			–0.14(8)			+0.22(13)	+0.12(7)		
1850	A_2	–0.50(3)							–0.14(11)		
	δ	+0.8(1)							+0.36(9)		
1931	A_2	+0.1(1)	–0.39(9)	–0.11(17)		0.0(2)	0.04(32)		+0.10(26)		+0.02(23)*
	δ	+0.18(7)	–0.06(5)	–0.01(15)		+0.4(1)	–0.29(18)		+0.19(19)		+0.24(18)
1944	A_2	–0.2(2)	–0.1(7)		+0.42(19)	–0.6(4)					+0.29(30)*
	δ	+0.4(2)	–0.2(4)		+0.8(5)	+1.3(8)					+0.44(36)
1972	A_2	–0.5(1)		+0.16(13)	+0.54(22)					–0.12(26)	
	δ	+0.8(5)		+0.25(19)	0.8(3)					+0.34(16)	
2150	A_2	–0.4(1)	–0.4(2)								–0.34(25)*
	δ	+0.7(3)	–0.1(1)								+0.55(74)
2173	A_2	–0.2(1)	–0.6(1)	+0.05(14)			–0.50(20)				–0.11(15)*
	δ	+0.4(1)	+0.05(9)	+0.14(13)			0.00(12)				–0.01(14)
2242	A_2	–0.2(1)	–0.4(2)	+0.16(13)		–0.3(2)					
	δ	+0.4(1)	–0.07(9)	+0.15(19)		+0.5(2)					
2253	A_2	+0.1(1)	–55(15)		–0.20(12)						
	δ	+0.18(7)	+0.03(9)		–0.08(11)						
2270	A_2	–0.5(1)		–0.07(13)							
	δ	+0.7(3)		+0.03(12)							
2283	A_2	–0.23(9)				–0.3(1)	–0.29(18)				
	δ	+0.44(9)				+0.5(1)	–0.11(10)				
2299	A_2	–0.3(1)		+0.05(10)	–0.39(16)	–0.3(1)					
	δ	+0.6(1)		+0.14(10)	–0.25(15)	+0.5(2)					
2359	A_2	–0.3(1)	–0.2(2)								
	δ	+0.5(1)	–0.17(8)								
2442	A_2	–0.4(1)	–0.6(1)	+0.17(13)	–0.42(16)	–0.5(1)					
	δ	+0.6(2)	+0.08(11)	–0.07(11)	–0.28(17)	+0.8(5)					
2455	A_2	+0.03(9)	–0.7(1)	–0.04(13)	–0.63(12)						
	δ	+0.24(6)	+0.1(1)	+0.05(12)	–0.52(21)						

* Marked values correspond to the resonances at $E_\circ$=1931 keV (E^*=3019 keV, J^π_f=3/2$^-$), 1944–2173 keV (1904 keV), 2150 keV (1932 keV).

For each direct γ-transition from the proton resonance (at $E_\circ$) to the low-lying state (at E^*_f) two parameters were determined: values A_2 in the angular distributon $W(\theta) = \sum_k A_k P_k(cos\theta)$ of γ-rays and mixing ratio $\delta = \sqrt{\Gamma_\gamma(E2)}/\sqrt{\Gamma_\gamma(M1)}$.

The discussion about the deviation of sign destribution of experimental mixing ratios in a case of transitions between states with J^π=J^π_f=3/2$^-$ (22 positive values) from the prediction of the statistical model (equal number of each sign) can be found in [81By03, 88Iz01].

Target isotope: $^{62}_{28}$Ni $I^{\pi}_{\circ} = 0^{+}$ *Abundance:* 3.634(2) % $S_{p} = 6122.44(7)$ keV

$^{63}_{29}$**Cu**(p)

$E_{\circ}$ [keV]	$2J^{\pi}$	$2T$	Γ_{p} [eV]	γ^{2}_{p} [keV]	Yield(p,γ)	Γ_{γ} [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^{*}_{analog} [keV]	E_{cm} [keV]	E^{*} [keV]	Ref.
1179.18(6)										1160.46	7282.9(1)	86De14
1179.7(2)										1161.0	7283.4(2)	86De14
1215(3)					100					1196	7318(3)	68Tr04
1261.74(7)					100					1241.71	7364.2(1)	86De14 68Tr04
1298.27(9)					208*					1277.66	7400.1(1)	86De14 68Tr04
1299.07(7)										1278.45	7400.9(1)	86De14
1374.89(7)					151					1353.07	7475.5(1)	86De14 68Tr04
1414(3)					141					1392	7514(3)	68Tr04
1432.07(23)					168*					1409.34	7531.8(2)	86De14 68Tr04
1432.74(22)										1410.00	7532.4(2)	86De14
1474(3)					197*					1451	7573(3)	68Tr04
1489(3)					119					1465	7588(3)	68Tr04
1509.57(8)					435					1485.61	7608.1(1)	86De14 68Tr04
1522(3)					160					1498	7620(3)	68Tr04
1548(3)					255*					1523	7646(3)	68Tr04
1566(3)					116					1541	7664(3)	68Tr04
1587(3)					264*					1562	7684(3)	68Tr04
1593(3)					230*					1568	7690(3)	68Tr04
1603(3)					114					1578	7700(3)	68Tr04
1615.7(2)					382*					1590.1	7712.5(2)	86De14 68Tr04
1620(3)					246*					1594	7717(3)	68Tr04
1627(3)					137					1601	7724(3)	68Tr04
1635.71(24)					370					1609.75	7732.2(2)	86De14 68Tr04
1636.40(9)					236*					1610.40	7732.9(1)	86De14 68Tr04
1649.01(15)					564*					1622.84	7745.3(1)	86De14 68Tr04
1649.38(12)										1623.20	7745.6(1)	86De14
1658(3)					372*					1632	7754(3)	68Tr04
1677.2(5)					432*					1650.6	7773.0(5)	86De14 68Tr04
1684(3)					165*					1657	7780(3)	68Tr04
1694(3)					252*					1667	7790(3)	68Tr04
1704(3)					174*					1677	7799(3)	68Tr04
1708(3)					407*					1681	7803(3)	68Tr04
1717(3)					480*					1690	7812(3)	68Tr04
1722(3)					314*					1695	7817(3)	68Tr04
1728(3)					177					1701	7823(3)	68Tr04
1733(3)					412					1705	7828(3)	68Tr04
1740(3)					119					1712	7835(3)	68Tr04
1750(3)					245					1722	7845(3)	68Tr04
1752(3)					267					1724	7847(3)	68Tr04
1765(3)					312					1737	7859(3)	68Tr04
1772(3)					557					1744	7866(3)	68Tr04
1779(3)					226					1751	7873(3)	68Tr04
1785(3)					723					1757	7879(3)	68Tr04
1791(3)					219					1763	7885(3)	68Tr04
1793(3)					239					1765	7887(3)	68Tr04

(continued) $^{63}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
1797(3)					274					1768	7891(3)	68Tr04
1801(3)					551					1772	7895(3)	68Tr04
1805(3)					169					1776	7899(3)	68Tr04
1813(3)					359					1784	7907(3)	68Tr04
1819(3)					532					1790	7913(3)	68Tr04
1823(3)					576					1794	7917(3)	68Tr04
1826(3)					192					1797	7919(3)	68Tr04
1830(3)					290					1801	7923(3)	68Tr04
1833(3)					374					1804	7926(3)	68Tr04
1838(3)					294					1809	7931(3)	68Tr04
1843(3)					133					1814	7936(3)	68Tr04
1848(3)					489					1819	7941(3)	68Tr04
2231(5)	3^-,5									2196	8318(5)	84SiZR
2238(5)	3^-									2202	8325(5)	84SiZR
2251(5)	3^-,5									2215	8338(5)	84SiZR
2268(5)	3^-									2232	8354(5)	84SiZR
2275(5)	1^-,5									2239	8361(5)	84SiZR
2285(5)	1^-,5									2249	8371(5)	84SiZR
2311(2)	1^+		20(10)	0.89						2274	8397(2)	76Bi0A 70Br33
2320(2)	1^+		10(5)	0.43						2283	8406(2)	76Bi0A 70Br33
2335(2)	1^+		35(10)	1.44						2298	8420(2)	76Bi0A
2354(2)	1^+		15(5)	0.58						2317	8439(2)	76Bi0A
2360(2)	1^+		30(10)	1.12						2323	8445(2)	76Bi0A
2385(2)	1^+		20(10)	0.70						2347	8470(2)	76Bi0A 70Br33
2392(2)	1^+		8(5)	0.27						2354	8476(2)	76Bi0A
2404(2)	1^+		10(5)	0.33						2366	8488(2)	76Bi0A
2417(2)	1^+		15(5)	0.47						2379	8501(2)	76Bi0A 70Br33
2440(2)	1^+		115(25)	3.37						2401	8524(2)	76Bi0A 70Br33
2444(2)	1^+		30(10)	0.67						2405	8528(2)	76Bi0A 70Br33
2457(2)	$\langle 1^+ \rangle$		10(5)	0.28						2418	8540(2)	76Bi0A 70Br33
2470(2)	1^+		35(10)	0.94						2431	8553(2)	76Bi0A 70Br33
2474(2)	1^-		30							2435	8557(2)	70Br33 71Lo22
2478(2)	1^+		30(10)	0.78						2439	8561(2)	76Bi0A 70Br33
2481(2)	1^-		180					0.44(8)	0.0	2442	8564(2)	70Br33 77Kr05 75Kr06
2483(2)	1^+		135(25)	3.47						2444	8566(2)	76Bi0A 70Br33
2495(2)	1^+		90(20)	2.23						2455	8578(2)	76Bi0A 70Br33
2512(5)	5,3^-							0.32(10)		2472	8595(5)	75Kr06 84SiZR
2528(2)	1^+		30(10)	0.68						2488	8610(2)	76Bi0A 70Br33
2534(2)	1^+		10(5)	0.22						2494	8616(2)	76Bi0A 70Br33
2546	$\langle 5^- \rangle$							0.11(3)		2506	8628(5)	75Kr06 75Kr10
2548(2)	1^+		65(29)	1.38						2508	8630(2)	76Bi0A 70Br33
2556(5)	5^-							0.28(10)		2515	8638(5)	75Kr10 77Kr05
2573(2)	$[1^+]$		5(5)	0.10						2532	8655(2)	76Bi0A 70Br33
2584(5)	3^-,5									2543	8665(5)	84SiZR
2603(2)	1^+		25(10)	0.46						2562	8684(2)	76Bi0A 70Br33

(continued) $^{63}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.		
2612(2)	3^-		20(10)	0.75		0.13	0.069			2571	8693(2)	74Wi15	70Br33	84SiZR
2620(2)	3^-		15(5)	0.56		0.04	0.119			2572	8694(2)	74Wi15	70Br33	84SiZR
2626(2)	1^+		55(15)	1.98						2584	8707(2)	76Bi0A	70Br33	
2633(2)	1^+		60(15)	2.12						2591	8714(2)	76Bi0A	70Br33	
2637(2)	$\langle 3^- \rangle$		5(5)	0.18		0.03	0.019			2594.7	8717(2)	74Wi15	70Br33	84SiZR
2638(2)	3^-		10(5)	0.35		0.19	0.101			2595.7	8718(2)	74Wi15	70Br33	
2639(2)	$\langle 3^- \rangle$		5(5)	0.17		0.13	0.026			2597.0	8720(2)	74Wi15	75Kr06	
2647(2)	3^-		15(5)	0.51		0.26	0.225			2604.6	8727(2)	74Wi15	70Br33	84SiZR
2651(2)	$\langle 3^- \rangle$		10(5)	0.34		0.15	0.248			2608.5	8731(2)	74Wi15	70Br33	
2651(2)	1^+		15(10)	0.50						2609	8731(2)	76Bi0A	70Br33	
2654(2)	$[3^-]$		5(5)	0.16		0.16	0.122			2611.5	8734(2)	74Wi15	77Kr05	
2656(2)	$\langle 3^- \rangle$		10(5)	0.33		0.09	0.278			2614.2	8737(2)	74Wi15	70Br33	
2662(2)	3^-		40(15)	1.31		0.34	0.585			2619.5	8742(2)	74Wi15	70Br33	75Kr10
2663(2)	3^-		125(25)	4.06		0.38	1.194		158	2620.8	8743(2)	74Wi15	70Br33	69Gu07
2666(2)	1^+		40(20)	1.29						2624	8746(2)	76Bi0A	70Br33	
2666(2)	$\langle 3^- \rangle$		5(5)	0.15		0.04	0.195			2624.1	8746(2)	74Wi15	71Lo22	
2667(2)	3^-		20(10)	0.64		0.09	0.164			2625.2	8748(2)	74Wi15	70Br33	
2675(5)	3^-		5(5)	0.15		0.11	0.228			2628.0	8750(2)	74Wi15	84SiZR	
2671(2)	1^+		10(5)	0.32						2629	8751(3)	76Bi0A	70Br33	
2681(2)	1^+		50(15)	1.55						2638	8761(3)	76Bi0A	70Br33	
2682(5)	3^-,5		10(5)	0.31						2643	8766(3)	76Bi0A	70Br33	84SiZR
2690(5)	3^-									2647	8770(5)	84SiZR		
2696(5)	3^-									2653	8776(5)	84SiZR		
2710(5)	3^-									2667	8789(5)	84SiZR		
2715(2)	1^+		15(5)	0.42						2672	8794(3)	76Bi0A	70Br33	
2719(2)	1^+		15(5)	0.42						2676	8798(3)	76Bi0A	70Br33	
2721(2)	$\langle 3^-,1^- \rangle$		5(5)	0.14						2678	8800(3)	76Bi0A	70Br33	84SiZR
2722(2)	$\langle 3^-,1^- \rangle$		5(5)	0.14						2679	8801(3)	76Bi0A	70Br33	
2723(2)	1^+		10(5)	0.28						2680	8802(3)	76Bi0A	70Br33	
2728(2)	$\langle 5^+,3^+ \rangle$		5(5)	0.14						2685	8807(3)	76Bi0A	70Br33	
2730(5)	3^-									2687	8809(5)	84SiZR		
2734(2)	1^+		40(10)	1.07						2691	8813(3)	76Bi0A	70Br33	
2742(2)	1^+		55(10)	1.45						2698	8821(3)	76Bi0A	70Br33	
2751(2)	1^+		10(5)	0.26						2707	8830(3)	76Bi0A	70Br33	
2756(2)	1^+		45(10)	1.13						2712	8835(3)	76Bi0A	70Br33	
2759(2)	1^+		10(5)	0.25						2715	8838(3)	76Bi0A	70Br33	
2799(2)	1^+		145(20)	3.29						2755	8877(3)	76Bi0A	70Br33	
2807(2)	1^+		60(10)	1.33						2762	8885(3)	76Bi0A	70Br33	
2821(2)	1^+		25(10)	0.54						2776	8899(3)	76Bi0A	70Br33	
2828(2)	$\langle 1^+ \rangle$		5(5)	0.11						2783	8906(3)	76Bi0A	70Br33	
2842(2)	1^+		10(5)	0.20						2797	8919(3)	76Bi0A	70Br33	
2846	$\langle 3^- \rangle$		10(10)	0.20						2801	8923(3)	76Bi0A		
2848	1^+		10(5)	0.20						2803	8925(3)	76Bi0A		
2855	1^+		20(10)	0.39						2810	8932(3)	76Bi0A		
2861	1^+		90(15)	1.75						2816	8938(3)	76Bi0A		

(continued) $^{63}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
2867	1^+		115(15)	2.21						2821	8944(3)	76Bi0A
2899	1^+		20(10)	0.36						2853	8975(3)	76Bi0A
2917	1^+		35(10)	0.60						2871	8993(3)	76Bi0A
2925	1^+		35(10)	0.58						2879	9001(3)	76Bi0A
2926	1^+		10(5)	0.17						2880	9002(3)	76Bi0A
2927	$\langle 5^+ \rangle$		5(5)	0.08						2881	9003(3)	76Bi0A
2939	1^+		100(15)	1.62						2892	9015(3)	76Bi0A
2945	$\langle 3^- \rangle$		8(5)	0.13						2898	9021(3)	76Bi0A
2946	1^+		40(10)	0.64						2899	9022(3)	76Bi0A
2954	1^+		20(10)	0.31						2907	9030(3)	76Bi0A
2958	1^+		30(10)	0.46						2911	9033(3)	76Bi0A
2963	1^+		40(10)	0.61						2916	9038(3)	76Bi0A
2968	1^+		90(15)	1.36						2921	9043(3)	76Bi0A
2974	1^+		30(10)	0.45						2927	9049(3)	76Bi0A
2976	1^+		70(15)	1.04						2929	9051(3)	76Bi0A
2983	1^+		75(15)	1.10						2936	9058(3)	76Bi0A
2984	$\langle 5^+ \rangle$		10(5)	0.15						2937	9059(3)	76Bi0A
2990	1^+		15(5)	0.22						2943	9065(3)	76Bi0A
2992	$\langle 3^- \rangle$		10(10)	0.14						2945	9067(3)	76Bi0A
2994	$\langle 5^+ \rangle$		5(5)	0.07						2946	9069(3)	76Bi0A
3016	1^+		40(10)	0.54						2968	9091(3)	76Bi0A
3018	1^+		50(10)	0.68						2970	9093(3)	76Bi0A
3020	1^+		95(15)	1.28						2972	9095(3)	76Bi0A
3023	1^+		40(10)	0.54						2975	9097(3)	76Bi0A
3029	1^+		35(10)	0.46						2981	9103(3)	76Bi0A
3034	$\langle 3^- \rangle$		13(10)	0.17						2986	9108(3)	76Bi0A
3036	$\langle 3^- \rangle$		5(5)	0.07						2988	9110(3)	76Bi0A
3038	1^+		25(10)	0.32						2990	9112(3)	76Bi0A
3042	$\langle 3^- \rangle$		10(10)	0.13						2994	9116(3)	76Bi0A
3044	$\langle 3^- \rangle$		55(25)	0.70						2996	9118(3)	76Bi0A
3046	1^+		35(10)	0.45						2998	9120(3)	76Bi0A
3048	$\langle 3^- \rangle$		10(10)	0.13						3000	9122(3)	76Bi0A
3050	$\langle 3^- \rangle$		15(10)	0.19						3002	9124(3)	76Bi0A
3053	1^+		100(20)	1.26						3005	9127(3)	76Bi0A
3054	$\langle 5^+ \rangle$		15(5)	0.19						3006	9128(3)	76Bi0A
3058	$\langle 3^- \rangle$		50(20)	0.62						3009	9132(3)	76Bi0A
3060	$\langle 3^- \rangle$		15(10)	0.19						3011	9134(3)	76Bi0A
3064	1^+		60(15)	0.74						3015	9138(3)	76Bi0A
3073	1^+		20(10)	0.24						3024	9147(3)	76Bi0A
3078	$\langle 3^- \rangle$		5(5)	0.06						3029	9152(3)	76Bi0A
3079	$\langle 3^- \rangle$		5(5)	0.06						3030	9153(3)	76Bi0A
3080	1^+		20(10)	0.24						3031	9154(3)	76Bi0A
3088	$\langle 3^- \rangle$		3(3)	0.04						3039	9161(3)	76Bi0A
3093	1^+		60(15)	0.69						3044	9166(3)	76Bi0A
3098	$\langle 3^- \rangle$		5(5)	0.06						3049	9171(3)	76Bi0A

(continued)

$^{63}_{29}$Cu(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3097	1^+		35(10)	0.40						3048	9170(3)	76Bi0A
3102	$\langle 3^- \rangle$		5(5)	0.06						3053	9175(3)	76Bi0A
3108.8(30)	1^+		250(50)	1.74						3059.5	9181.9(30)	76Ar0A
3114.5(30)	$\langle 5^+ \rangle$		16(10)	0.87						3065.1	9187.5(30)	76Ar0A
3127.9(30)	1^+		45(10)	0.13						3078.3	9200.7(30)	76Ar0A
3129.0(30)	1^+		20(10)	0.36						3079.0	9202.0(30)	76Ar0A
3132.8(30)	1^-		30(10)	0.40						3083.1	9205.5(30)	76Ar0A
3147.4(30)	1^+		90(18)	0.58						3097.4	9219.9(30)	76Ar0A
3160.6(30)	1^+		50(10)	0.32						3110.4	9232.9(30)	76Ar0A
3168.4(30)	1^+		10(10)	0.06						3118.1	9240.5(30)	76Ar0A
3177.4(30)	1^+		100(20)	0.61						3127.0	9249.4(30)	76Ar0A
3179.0(30)	1^+		30(10)	0.18						3129.0	9251.0(30)	76Ar0A
3189.4(30)	1^+		100(20)	0.60						3138.8	9261.2(30)	76Ar0A
3198.2(30)	1^+		60(12)	0.35						3147.4	9269.9(30)	76Ar0A
3202.2(30)	1^-		30(10)	0.35						3151.4	9273.8(30)	76Ar0A
3207.2(30)	1^-		30(10)	0.34						3156.3	9278.7(30)	76Ar0A
3224.0(30)	1^+		60(12)	0.34						3173.0	9295.0(30)	76Ar0A
3225.0(30)	1^+		60(12)	0.34						3174.0	9296.0(30)	76Ar0A
3236.6(30)	1^+		100(20)	0.55						3185.2	9307.7(30)	76Ar0A
3241.2(30)	1^+		200(40)	1.09						3189.8	9312.2(30)	76Ar0A
3242.1(30)	1^+		30(10)	0.16						3190.6	9313.1(30)	76Ar0A
3244.0(30)	1^+		50(10)	0.27						3193.0	9315.0(30)	76Ar0A
3247.8(30)	1^+		20(10)	0.11						3196.2	9318.7(30)	76Ar0A
3261.8(30)	1^+		30(10)	0.18						3210.0	9332.5(30)	76Ar0A
3266.0(30)	$\langle 3^+ \rangle$		30(10)	1.16						3214.0	9337.0(30)	76Ar0A
3269.8(30)	1^+		50(10)	0.26						3217.9	9340.3(30)	76Ar0A
3275.8(30)	1^+		100(20)	0.51						3223.8	9346.2(30)	76Ar0A
3277.2(30)	1^+		130(26)	0.66						3225.2	9347.6(30)	76Ar0A
3280.8(30)	$\langle 5^+ \rangle$		25(10)	0.93						3228.7	9351.2(30)	76Ar0A
3282.4(30)	1^+		90(18)	0.46						3230.3	9352.7(30)	76Ar0A
3287.6(30)	1^+		50(10)	0.25						3235.4	9357.9(30)	76Ar0A
3291.8(30)	1^+		45(10)	0.22						3239.5	9362.0(30)	76Ar0A
3295.0(30)	1^-		63(12)	0.61						3243.0	9365.0(30)	76Ar0A
3298.6(30)	1^+		130(26)	0.64						3246.2	9368.7(30)	76Ar0A
3301.8(30)	$\langle 5^+ \rangle$		30(10)	1.08						3249.4	9371.8(30)	76Ar0A
3307.2(30)	$\langle 5^+ \rangle$		25(10)	0.89						3254.7	9377.1(30)	76Ar0A
3311.0(30)	$\langle 5^+ \rangle$		25(10)	0.88						3258.0	9381.0(30)	76Ar0A
3314.2(30)	1^+		35(10)	0.17						3261.6	9384.0(30)	76Ar0A
3317.2(30)	1^+		100(20)	0.48						3264.5	9387.0(30)	76Ar0A
3320.2(30)	1^-		16(10)	0.15						3267.5	9389.9(30)	76Ar0A
3321.4(30)	1^+		35(10)	0.17						3268.7	9391.1(30)	76Ar0A
3327.4(30)	$\langle 5^+ \rangle$		15(10)	0.51						3274.6	9397.0(30)	76Ar0A
3334.8(30)	1^+		150(30)	0.85						3281.9	9404.3(30)	76Ar0A
3335.0(30)	$\langle 3^+ \rangle$		30(10)	1.00						3282.0	9405.0(30)	76Ar0A
3340.8(30)	$\langle 5^+ \rangle$		25(10)	0.83						3287.8	9410.2(30)	76Ar0A

(continued) $^{63}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3348.0(30)	1^+		50(10)	0.28						3295.0	9417.0(30)	76Ar0A
3351.0(30)	1^+		95(19)	0.52						3298.0	9420.0(30)	76Ar0A
3367.2(30)	1^+		85(17)	0.46						3313.8	9436.2(30)	76Ar0A
3373.4(30)	1^+		35(10)	0.19						3319.9	9442.3(30)	76Ar0A
3375.0(30)	1^+		18(10)	0.09						3321.0	9444.0(30)	76Ar0A
3379.8(30)	1^+		135(28)	0.71						3326.2	9448.6(30)	76Ar0A
3384.8(30)	1^+		130(26)	0.68						3331.1	9453.5(30)	76Ar0A
3394.4(30)	1^+		50(10)	0.26						3340.5	9463.0(30)	76Ar0A
3400.0(30)	1^+		350(70)	1.46						3346.0	9468.0(30)	76Ar0A
3400.8(30)	1^+		100(20)	0.42						3346.8	9469.3(30)	76Ar0A
3406.2(30)	1^+		120(24)	0.49						3352.1	9474.6(30)	76Ar0A
3409.2(30)	1^+		105(21)	0.43						3355.1	9477.5(30)	76Ar0A
3413.8(30)	1^+		48(10)	0.19						3359.6	9482.1(30)	76Ar0A
3434.4(30)	1^+		160(32)	0.63						3379.9	9502.3(30)	76Ar0A
3436.0(30)	1^+		200(40)	0.79						3381.0	9504.0(30)	76Ar0A
3436.6(30)	1^+		50(10)	0.20						3382.1	9504.5(30)	76Ar0A
3440.7(30)	1^-		66(13)	0.49						3386.1	9508.5(30)	76Ar0A
3445.7(30)	1^+		400(80)	1.55						3391.0	9513.4(30)	76Ar0A
3448.5(30)	1^+		20(10)	0.08						3393.8	9516.2(30)	76Ar0A
3452.6(30)	1^-		40(10)	0.35						3397.8	9520.2(30)	76Ar0A
3457.0(30)	1^+		320(64)	1.22						3402.0	9525.0(30)	76Ar0A
3458.0(30)	1^+		50(10)	0.19						3403.0	9526.0(30)	76Ar0A
3466.4(30)	$\langle 5^+ \rangle$		34(10)	0.87						3411.4	9533.8(30)	76Ar0A
3471.0(30)	1^-		68.8(70)	0.48						3416.0	9538.0(30)	76Ar0A
3472.4(30)	1^+		400(80)	1.49						3417.3	9539.7(30)	76Ar0A
3474.4(30)	1^+		30(10)	0.11						3419.3	9541.7(30)	76Ar0A
3479.0(30)	1^+		100(20)	0.37						3424.0	9546.0(30)	76Ar0A
3479.8(30)	1^+		100(20)	0.37						3424.6	9547.0(30)	76Ar0A
3482.2(30)	$\langle 3^+ \rangle$		30(10)	0.91						3426.9	9549.4(30)	76Ar0A
3482.4(30)	1^-		82.1(116)	0.57						3427.1	9549.6(30)	76Ar0A
3484.6(30)	1^+		120(24)	0.44						3429.3	9551.7(30)	76Ar0A
3486.0(30)	1^+		40(10)	0.15						3431.0	9553.0(30)	76Ar0A
3493.6(30)	1^+		85(17)	0.31						3438.1	9560.6(30)	76Ar0A
3498.2(30)	1^+		70(14)	0.25						3442.7	9565.1(30)	76Ar0A
3500.0(30)	1^-		170.4(152)	1.15						3444.0	9567.0(30)	76Ar0A
3500.8(30)	1^-		66.3(135)	0.45						3445.2	9567.7(30)	76Ar0A
3504.8(30)	1^-		85.6(111)	0.57						3449.2	9571.6(30)	76Ar0A
3508.8(30)	1^-		104.2(100)	0.69						3453.1	9575.5(30)	76Ar0A
3509.2(30)	1^+		80(16)	0.24						3453.5	9575.9(30)	76Ar0A
3509.7(30)	1^-		191.0(127)	1.26						3454.0	9576.4(30)	76Ar0A
3516.6(30)	1^-		207.0(130)	1.35						3460.8	9583.2(30)	76Ar0A
3518.2(30)	1^+		36(10)	0.13						3462.4	9584.8(30)	76Ar0A
3519.6(30)	1^-		125.4(106)	0.82						3463.7	9586.2(30)	76Ar0A
3529.3(30)	1^-		160.0(129)	1.02						3473.3	9595.7(30)	76Ar0A
3530.2(30)	1^-		511.5(189)	3.27						3474.2	9596.6(30)	76Ar0A

(continued) $^{63}_{29}\mathbf{Cu}$(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3532.6(30)	1^-		50.9(82)	0.32					1008	3476.5	9599.0(30)	69Gu07 76Ar0A
3533.6(30)	1^+		90(18)	0.31						3477.5	9600.0(30)	76Ar0A
3534.7(30)	1^+		70(14)	0.24						3478.6	9601.0(30)	76Ar0A
3539.2(30)	1^+		320(64)	1.08						3483.0	9605.5(30)	76Ar0A
3544.3(30)	1^+		20(10)	0.67						3488.0	9610.5(30)	76Ar0A
3546.8(30)	1^+		61(12)	0.20						3490.5	9612.9(30)	76Ar0A
3549.6(30)	1^-		30.6(69)	0.19						3493.3	9615.7(30)	76Ar0A
3552.4(30)	1^+		80(16)	0.26						3496.0	9618.5(30)	76Ar0A
3553.2(30)	1^-		50.1(79)	0.31						3496.8	9619.2(30)	76Ar0A
3559.4(30)	1^+		30(10)	0.10						3502.9	9625.3(30)	76Ar0A
3561.6(30)	$\langle 3^+ \rangle$		50(10)	1.07						3505.1	9627.5(30)	76Ar0A
3564.2(30)	1^+		21(10)	0.07						3507.6	9630.1(30)	76Ar0A
3569.2(30)	1^+		54(10)	0.17						3512.5	9635.0(30)	76Ar0A
3578.2(30)	1^+		200(40)	0.64						3521.4	9643.8(30)	76Ar0A
3580.4(30)	1^+		150(30)	0.48						3523.6	9646.0(30)	76Ar0A
3582.6(30)	1^+		18(10)	0.06						3525.7	9648.2(30)	76Ar0A
3584.2(30)	1^+		150(30)	0.47						3527.3	9649.7(30)	76Ar0A
3585.0(30)	1^+		18(10)	0.06						3528.0	9651.0(30)	76Ar0A
3586.0(30)	$\langle 3^+ \rangle$		20(10)	0.41						3529.0	9652.0(30)	76Ar0A
3589.6(30)	1^+		25(10)	0.08						3532.6	9655.1(30)	76Ar0A
3595.8(30)	1^+		30(10)	0.09						3538.7	9661.2(30)	76Ar0A
3617.8(30)	1^-		35(10)	0.19						3560.4	9682.8(30)	76Ar0A
3619.6(30)	1^+		71(14)	0.21						3562.1	9684.6(30)	76Ar0A
3620.6(30)	1^+		25(10)	0.07						3563.1	9685.6(30)	76Ar0A
3626.0(30)	$\langle 3^+ \rangle$		70(14)	1.33						3568.0	9691.0(30)	76Ar0A
3627.6(30)	1^+		32(10)	0.10						3570.0	9692.5(30)	76Ar0A
3631.0(30)	1^+		43(10)	0.13						3573.0	9696.0(30)	76Ar0A
3636.2(30)	1^+		65(13)	0.19						3578.5	9700.9(30)	76Ar0A
3641.2(30)	1^+		36(10)	0.11						3583.4	9705.8(30)	76Ar0A
3646.4(30)	1^+		500(100)	1.44						3588.5	9711.0(30)	76Ar0A
3651.2(30)	1^+		200(40)	0.57						3593.2	9715.7(30)	76Ar0A
3663.4(30)	1^+		25(10)	0.07						3605.3	9727.7(30)	76Ar0A
3666.0(30)	1^-		25(10)	0.15						3608.0	9730.0(30)	76Ar0A
3669.2(30)	1^+		93(19)	0.26						3611.0	9733.4(30)	76Ar0A
3670.0(30)	1^+		60(12)	0.17						3612.0	9734.0(30)	76Ar0A
3683.2(30)	$\langle 3^+ \rangle$		50(10)	0.86						3624.7	9747.2(30)	76Ar0A
3692.8(30)	1^+		50(10)	0.13						3634.2	9756.6(30)	76Ar0A
3701.3(30)	1^+		30(10)	0.07						3642.5	9765.0(30)	76Ar0A
3705.8(30)	1^+		30(10)	0.08						3647.0	9769.4(30)	76Ar0A
3707.0(30)	1^+		70(14)	0.19						3648.0	9771.0(30)	76Ar0A
3709.9(30)	1^+		35(10)	0.09						3651.0	9773.5(30)	76Ar0A
3713.7(30)	1^+		450(90)	1.19						3654.8	9777.2(30)	76Ar0A
3715.6(30)	1^+		60(12)	0.16						3656.6	9779.1(30)	76Ar0A
3722.3(30)	1^+		30(10)	0.08						3663.2	9785.7(30)	76Ar0A
3724.0(30)	1^+		150(30)	0.39						3665.0	9787.0(30)	76Ar0A

(continued) $^{63}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3728.4(30)	1^+		80(16)	0.21						3669.2	9791.7(30)	76Ar0A
3738.2(30)	1^+		50(10)	0.13						3678.9	9801.3(30)	76Ar0A
3739.7(30)	1^+		350(70)	0.89						3680.3	9802.8(30)	76Ar0A
3742.2(30)	1^+		50(10)	0.13						3682.8	9805.2(30)	76Ar0A
3744.0(30)	1^+		320(64)	0.81						3685.0	9807.0(30)	76Ar0A
3748.2(30)	1^-		40(10)	0.18						3688.7	9811.1(30)	76Ar0A
3754.6(30)	1^+		70(14)	0.17						3695.0	9817.4(30)	76Ar0A
3755.2(30)	9^+		<4					0.10(4)		3695.6	9818.0(30)	72Sz01 76Ar0A
3760.0(30)	1^-		32.1(71)	0.14						3700.0	9823.0(30)	76Ar0A
3767.0(30)	1^+		150(30)	0.37						3707.0	9830.0(30)	76Ar0A
3768.1(30)	1^-		45.5(62)	0.20						3708.3	9830.7(30)	76Ar0A
3769.0(30)	1^+		90(18)	0.22						3709.0	9832.0(30)	76Ar0A
3774(4)	$\langle 9^+ \rangle$							0.21(5)		3714	9837(4)	72Sz01
3777.2(30)	1^+		180(36)	0.44						3717.2	9839.7(30)	76Ar0A
3779.2(30)	1^+		40(10)	0.10						3719.2	9841.7(30)	76Ar0A
3785.0(30)	1^+		70(14)	0.17						3725.0	9847.0(30)	76Ar0A
3787.5(30)	9^+		<4					0.45(5)		3727.4	9849.8(30)	72Sz01 76Ar0A
3791.3(30)	9^+		<4					0.66(6)		3731.1	9853.6(30)	72Sz01 76Ar0A
3795.7(30)	9^+		<4					0.24(4)		3735.5	9857.9(30)	72Sz01 76Ar0A
3796.2(30)	1^+		100(20)	0.24						3735.9	9858.4(30)	76Ar0A
3797.2(30)	1^+		60(12)	0.14						3736.9	9859.4(30)	76Ar0A
3803.7(30)	1^+		70(14)	0.16						3743.3	9865.8(30)	76Ar0A
3805.3(30)	9^+		<4							3744.9	9867.3(30)	76Ar0A
3812.0(30)	1^+		185(37)	0.43						3751.0	9874.0(30)	76Ar0A
3814.0(30)	1^+		120(24)	0.28						3753.0	9876.0(30)	76Ar0A
3823.0(30)	1^+		200(40)	0.46						3762.0	9885.0(30)	76Ar0A
3826.0(30)	5^-		20(10)	1.60						3765.0	9888.0(30)	76Ar0A
3835.2(30)	1^+		80(16)	0.18						3774.3	9896.8(30)	76Ar0A
3837.4(30)	1^+		50(10)	0.11						3776.5	9898.9(30)	76Ar0A
3844.0(30)	1^+		50(10)	0.11						3783.0	9905.0(30)	76Ar0A
3847.5(30)	1^+		50(10)	0.11						3786.4	9908.9(30)	76Ar0A
3848.2(30)	1^+		50(10)	0.11						3787.1	9909.6(30)	76Ar0A
3850.8(30)	1^+		200(40)	0.44						3789.7	9912.1(30)	76Ar0A
3853.4(30)	1^+		200(40)	0.44						3792.2	9914.7(30)	76Ar0A
3854.5(30)	1^-		72.0(73)	0.28						3793.3	9915.8(30)	76Ar0A
3861.4(30)	1^-		81.7(73)	0.32						3800.1	9922.5(30)	76Ar0A
3873.0(30)	1^+		70(14)	0.15						3812.0	9934.0(30)	76Ar0A
3874.0(30)	1^+		20(10)	0.04						3813.0	9935.0(30)	76Ar0A
3876.2(30)	1^+		100(20)	0.22						3814.7	9937.1(30)	76Ar0A
3880.0(30)	1^+		300(15)	0.64						3818.0	9941.0(30)	76Ar0A
3884.0(30)	$\langle 3^+ \rangle$		60(12)	0.74						3822.0	9945.0(30)	76Ar0A
3886.0(30)	1^+		80(16)	0.17						3824.0	9947.0(30)	76Ar0A
3892.6(30)	1^+		160(32)	0.34						3830.8	9953.3(30)	76Ar0A
3899.0(30)	1^+		90(18)	0.19						3837.0	9960.0(30)	76Ar0A
3901.2(30)	1^+		90(18)	0.19						3839.3	9961.7(30)	76Ar0A

(continued) $^{63}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Yield(p,γ)	Γ_γ [eV]	$\Gamma_{p'}$ [eV]	$S_{p\gamma}$ [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3901.8(30)	1^+		50(10)	0.10						3839.9	9962.3(30)	76Ar0A
3905.0(30)	1^+		80(16)	0.17						3843.0	9965.0(30)	76Ar0A
3908.0(30)	1^+		90(18)	0.19						3846.0	9968.0(30)	76Ar0A
3908.4(30)	1^+		50(10)	0.10						3846.4	9968.8(30)	76Ar0A
3910.2(30)	$\langle 5^+ \rangle$		30(10)	0.35						3848.1	9970.6(30)	76Ar0A
3916.2(30)	1^+		50(10)	0.10						3854.0	9976.5(30)	76Ar0A
3919.2(30)	1^+		90(18)	0.18						3857.0	9979.4(30)	76Ar0A
4788	$3^+,5^+$		62000**						$\langle 2302 \rangle$	4712	10834	69Gu07
5433	1^+		65000**						$\langle 2960 \rangle$	5347	11469	69Gu07

Additional data on this isotope can be found in [89Iz01, 86Iz01, 86Si09, 86Oz01, 84SiZS, 83Ma69, 83Og03, 82Ar0A, 77Kr05, 76Ar01, 74Kr0B, 74Ra01, 72Ki15, 69Br0A, 66Ga14].
* Resonance was investigated for a structure and is thought to be complex [86De14, 68Tr04].
** $(2J+1)\Gamma_p$ instead of Γ_p; for these resonances Γ=31 and 84 keV are given in [69Gu07].
For the resonances with E_p=1.2–1.9 MeV γ-yield is given in number of quanta per μCoulomb.
Γ is put in the column Γ_p due to the assumption Γ_p/Γ=1 [76Ar0A].

Branching ratios of γ-transitions [75Kr10, 02Nu0A]. $^{63}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	Branching ratios (Percentage)									Com.	Ref.
		0.0 3^-	670 1^-	962 5^-	1325 7^-	1412 5^-	1547 3^-	1861 7^-	2011 3^-	2062 1^-	E^*, keV $2J^\pi_f$	
669.67(5)	1^-	100										
962.10(4)	5^-	100										
1326.98(7)	7^-	80		20								75Kr10
1412.04(4)	5^-	85	15									75Kr10
1547.06(6)	3^-	96	4									75Kr10
1861.21(13)	7^-	50		50								75Kr10
2011.51(20)	3^-	50	14	36								75Kr10
2062.22(9)	$\langle 1 \rangle^-$	20	80									75Kr10
2081.32(22)	$5^{\langle - \rangle}$	80			20							75Kr10
2092.58(14)	7^-											
2207.85(11)	9^-											
2336.56(12)	5^-	40		60								75Kr10
2337.4(6)	$3^+,5^+$											
2404.79(10)	7^-	25		75								75Kr10
2429(3)												
2497.48(23)	$\langle 3^- \rangle$	x										75Kr10
2506.45(19)	9^+											
2512.0(5)	1–5											

(continued) $^{63}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	Branching ratios Percentage									Com.	Ref.
		0.0 3^-	670 1^-	962 5^-	1325 7^-	1412 5^-	1547 3^-	1861 7^-	2011 3^-	2062 1^-	E^*, keV $2J_f^\pi$	
2535.79(7)	$\langle 5\rangle^-$	20		80								75Kr10
2547.51(16)	9^-											
2673.21(18)	$5,7^-$											
2677.1(3)	11^-											
2678.7(5)	$\langle X^-\rangle$	34					66					75Kr10
2682.0(8)	$1^-,3^-$											
2696.60(13)	$1^-,3^-$	x										75Kr10
2956.7(11)		x										75Kr10
2977.8(6)	1^-–5^-											
3032.1(10)	$1^-,3^-$											
3043.4(4)	$\langle 5^-\rangle$	x										75Kr10
3093.4(22)												
3101.3(4)	$1^-,3^-$	x										
3127.9(11)	X^-								x			75Kr10
3183(8)	X^-											
3208(8)	$3^+,5^+$											
3225.4(5)	$\langle 5^-\rangle$	34	66									75Kr10
3248(3)												
3263.6(5)	$\langle X^-\rangle$	60	46									75Kr10
3291(3)												
3292.6(6)		x										75Kr10
3297.43(11)	3^-											
3307.6(5)	$\langle 3^+\rangle$											
3309.7(5)	$\langle X^+\rangle$	50					50					75Kr10
3370(8)												
3389(15)												
3406.4(8)		x										75Kr10
3418.3(8)												
3425.9(24)	$1^-,3^-$											
3429.9(7)		10	90									75Kr10

Partial radiative widths of resonances with J^π=3/2$^-$ [74Wi15]. Part 1.

$^{63}_{29}$Cu(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Γ_p [eV]	Γ_γ [eV]	Partial radiative widths [meV]											Ref.
E^*					0.0	670	962	1327	1412	1547	1861	2012	2062	2081	2093	
$2J^\pi_f$					3$^-$	1$^-$	5$^-$	7$^-$	5$^-$	3$^-$	7$^-$	3$^-$	⟨1$^-$⟩	⟨5$^-$⟩	7$^-$	
8564.9(2)*	1$^-$	2481			220	110	26		55	170		37	77			75Kr10
8629.0(4)*	5$^-$	2546			18	2.5	20	11	11	23	10	14				75Kr10
8639.2(2)*	5$^-$	2556			46	10	28	14	29	26		8	11	11		75Kr10
8693.3(26123)	3$^-$	2612.3	20	0.13	83.0	15.3						30.4				74Wi15
8694.8(26139)	3$^-$	2613.9	15	0.04	17.3	13.9			6.9							74Wi15
8717.1(26365)	3$^-$	2636.5	5	0.03	172.3		13.4									74Wi15
8718.2(26376)	3$^-$	2637.6	10	0.19	11.2		15.0									74Wi15
8719.6(26390)	3$^-$	2639.0	5	0.13	18.1		17.1			26.2	20.1			12.1	31.7	74Wi15
8727.0(26466)	3$^-$	2646.6	15	0.26	156.4	43.5			19.2				15.6	26.1		74Wi15
8731.0(26506)	3$^-$	2650.6	10	0.15	8.6		105.5		33.1							74Wi15
8733.9(26536)	3$^-$	2653.6	5	0.16	23.4	14.3	62.5			56.3						74Wi15
8736.7(26564)	3$^-$	2656.4	10	0.09	12.4	12.1	31.8					16.9	19.8			74Wi15
8741.9(26617)	3$^-$	2661.7	40	0.34	132.1		72.1		101.9	30.5						74Wi15
8743.3(26631)	3$^-$	2663.1	125	0.38	97.1	62.8	120.0		42.2	53.8						74Wi15
8743.3*	3$^-$	2659			60	50	79	11	46	18		16	8	13		75Kr10
8746.5(26664)	3$^-$	2666.4	5	0.04	11.3	10.6	17.8									74Wi15
8747.6(26675)	3$^-$	2667.5	20	0.09	13.3	21.2	51.3									74Wi15
8750.5(26704)	3$^-$	2670.4	5	0.11	77.2	9.3	7.9			19.7						74Wi15

* Presented parameters Γ_{γ_i} from [75Kr10] for three analog states (with $2J^\pi$=1$^-$,5$^-$,3$^-$) correspond to structures of many individual resonances as it can be seen from comparison with data for states with $2J^\pi$=3$^-$ studied in [74Wi15] (most of resonances beeing resolved). The original values E^* [75Kr10] for analog states with $2J^\pi$=1$^-$,5$^-$ are substitued by adopted values [02Nu0A].

Partial radiative widths of resonances with J^π=3/2$^-$ [74Wi15]. Part 2.

$^{63}_{29}$Cu(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Partial radiative widths [meV]														
E^*			2337	2405	2497	2536	2679	2697	2778	2831	2860	2886	2956	2979	3043	3101	3127
$2J^\pi_f$			5$^-$	7$^-$	⟨3$^-$⟩	⟨5$^-$⟩	⟨X$^-$⟩	X$^-$							⟨5$^-$⟩	X$^-$	
8564.9(2)	1$^-$	2481		19	100	7	99	51				33	33	26	35	44	
8629.0(4)	5$^-$	2546								10							
8639.2(2)	5$^-$	2556	8.7		15	22	8		12			7			16	9	9
8743.3	3$^-$	2659	16		4	9	17				24	8	11	9	4		

Partial radiative widths of resonances with J^π=3/2$^-$ [74Wi15]. Part 3.

$^{63}_{29}$Cu(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Partial radiative widths [meV]												
E^* $2J^\pi_\mathrm{f}$			3225 ⟨5$^-$⟩	3264 ⟨X$^-$⟩	3293	3310 X$^+$	3406	3430	3461	3476	3535	3657	3774	3902	3960
8564.9(2)	1$^-$	2481	48	16	57	75	35	48	37			44	26		
8629.0(4)	5$^-$	2546													
8639.2(2)	5$^-$	2556	9	13	11	25									
8743.3	3$^-$	2659	16		24	38			42	18	16			20	18

Target isotope: $^{64}_{28}$Ni $I^\pi_\circ = 0^+$ *Abundance:* 0.926(1) % S_p = 7452.79(98) keV

$^{65}_{29}$Cu(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ^2_p [keV]	Γ [keV]	Γ_n [eV]	E^*_analog [keV]	E_cm [keV]	E^* [keV]	Ref.	
1235								1216	8662	73Ho42	
1333								1312	8758	73Ho42	
1379								1358	8802	73Ho42	
1537								1513	8962	73Ho42	
1639								1614	9058	73Ho42	
1649								1623	9070	73Ho42	
1716								1689	9135	73Ho42	
1844(6)	3,1							1815	9268	88PaZM	73Ho42
1922(3)	3$^-$							1892	9345	88PaZM	
1968(9)	3,1							1937	9390	88PaZM	
2001(5)	3$^-$							1970	9423	88PaZM	
2066(9)	3							2034	9487	88PaZM	
2088(9)	3$^-$							2056	9508	88PaZM	
3114(2)	1$^+$		80			560		3066	10519(2)	70Br33	
3117(2)	1$^+$		20			40		3069	10522(2)	70Br33	
3122(2)	1$^-$,3$^-$		10			150	0.0	3074	10527(2)	70Br33	69Gu07
3123(2)	1$^+$		15			120		3075	10528(2)	70Br33	
3126(2)	1$^-$,3$^-$		10			60		3078	10531(2)	70Br33	
3133(2)	1$^+$		50			120		3085	10538(2)	70Br33	
3141(2)	1$^+$		10			25		3093	10545(2)	70Br33	
3145(2)	1$^+$		15			35		3097	10549(2)	70Br33	
3146(2)	3$^+$,5$^+$		5			20		3098	10550(2)	70Br33	
3154(2)	⟨1$^-$⟩		25			500		3105	10558(2)	70Br33	
3156(2)	1$^+$		110			475		3107	10560(2)	70Br33	
3158(2)	1$^+$		60			315		3109	10562(2)	70Br33	
3163(2)	1$^+$		60			150		3114	10567(2)	70Br33	
3164(2)	1$^+$		15			10		3115	10568(2)	70Br33	
3172(2)	1$^+$		30			180		3123	10576(2)	70Br33	
3174(2)	⟨1$^-$⟩		20			150	64	3125	10578(2)	70Br33	69Gu07

(continued) $^{65}_{29}$**Cu**(p)

$E_\circ$ [keV]	$2J^\pi$	$2T$	Γ_p [eV]	γ_p^2 [keV]	Γ [keV]	Γ_n [eV]	E^*_{analog} [keV]	E_{cm} [keV]	E^* [keV]	Ref.
3175(2)	⟨1^-⟩		20			80		3126	10579(2)	70Br33
3178(2)	1^+		60			360		3129	10582(2)	70Br33
3179(2)	1^+		120			440		3130	10583(2)	70Br33
3191(2)	⟨1^-⟩		10			60		3142	10595(2)	70Br33
3197.7(20)	1^-		35(5)	0.29		10(5)		3148.5	10601(2)	76Bi0A 71Mo16
3200.9(20)	⟨1^-⟩		75(15)	0.67		450(100)		3151.7	10604(2)	76Bi0A 71Mo16
3201.8(20)	⟨1^-⟩		35(10)	0.33		455(150)		3152.5	10605(2)	76Bi0A 71Mo16
3203.0(20)	⟨1^-⟩		30(10)	0.27		220(75)		3154.0	10607(2)	76Bi0A 71Mo16
3205(2)	1^+		40			20		3156	10608(2)	70Br33
3207(2)	1^+		20			10		3158	10610(2)	70Br33
3208(2)	1^-		125(25)	1.11		670(125)		3158.9	10612(2)	76Bi0A 71Mo16
3211(2)	1^+		125			250		3162	10614(2)	70Br33
3217(2)	1^-		100(25)	0.86		25(15)		3167.9	10621(2)	76Bi0A 71Mo16
3218(2)	1^-		120(30)	1.05		55(25)		3168.4	10621(2)	76Bi0A 71Mo16
3219(2)	1^-		210(5)	1.71		50(25)		3169.6	10622(2)	76Bi0A 71Mo16
3219(2)	1^-		170(50)	1.44		55(25)		3169.9	10623(2)	76Bi0A 71Mo16
3221(2)	⟨1^-⟩		50(20)	0.44		140(50)		3171.7	10624(2)	76Bi0A 71Mo16
3223(2)	⟨1^-⟩		60(15)	0.51		20(10)		3173.2	10626(2)	76Bi0A 71Mo16
3223(2)	1^-		120(30)	1.00		400(100)		3173.5	10626(2)	76Bi0A 71Mo16
3224(2)	1^-		120(30)	1.03		110(50)		3174.3	10627(2)	76Bi0A 71Mo16
3225(2)	1^-		160(35)	1.36		35(15)		3175.2	10628(2)	76Bi0A 71Mo16
3229(2)	1^-		35(10)	0.28		10(5)		3179.4	10632(2)	76Bi0A 71Mo16
3231(2)	1^+		20(10)			40		3181	10634(2)	70Br33
3234(2)	1^+		30(10)			170		3184	10637(2)	70Br33
3237(2)	⟨1^-⟩		45(10)			125		3187	10640(2)	70Br33
3239(2)	1^-,3^-		15(10)			120		3189	10642(2)	70Br33
3240(2)	1^+		30(10)			400		3190	10643(2)	70Br33
3243(2)	1^+		120(25)			500		3193	10646(2)	70Br33
3248(2)	1^+		20(10)			200		3198	10651(2)	70Br33
3254(2)	1^-,3^-		25(10)			250		3204	10657(2)	70Br33
3255(2)	1^+		100(20)			575		3205	10658(2)	70Br33
3260(2)	1^+		30(10)			180		3210	10663(2)	70Br33
3265(2)	1^+		50(10)			350		3215	10668(2)	70Br33
3277(2)	1^-,3^-		30(10)			300		3227	10679(2)	70Br33
3281(2)	1^-,3^-		30(10)			270		3231	10683(2)	70Br33
3283(2)	⟨1^+⟩		30(10)			250		3232	10685(2)	70Br33
3502	1^-,3^-		3000*		8		313	3448	10901	69Gu07
3896	1^-,3^-		11000*		19		695	3836	11289	69Gu07
4546	1^+		4000*		13		1330	4476	11929	69Gu07
4635	1^-,3^-		35000*		52		1417	4564	12017	69Gu07
5035	[1^+]		5000		39			4957	12410	78Be40
5105	5^+		9000		19		1921	5026	12479	78Be40 69Gu07
5218	1^-		6000		38			5137	12590	78Be40
5350	3^-				⟨34⟩			5267	12720	78Be40
5520					⟨27⟩			5434	12887	78Be40

(continued) $^{65}_{29}$**Cu**(p)

$E_{\circ}$ [keV]	$2J^{\pi}$	$2T$	$\mathit{\Gamma}_{p}$ [eV]	γ_{p}^{2} [keV]	$\mathit{\Gamma}$ [keV]	$\mathit{\Gamma}_{n}$ [eV]	E^{*}_{analog} [keV]	E_{cm} [keV]	E^{*} [keV]	Ref.
5570					⟨20⟩			5484	12936	78Be40
5912	5^{+}		1500		29			5820	13273	78Be40
5985	5^{+}		7500		30		2794	5892	13345	78Be40 69Gu07
6042	1^{+}		22000		51			5940	13393	78Be40 69Gu07
6150	5^{+}		3000		39			6055	13507	78Be40
6339	⟨3^{+},5^{+}⟩				15		⟨3130⟩	6241	13694	69Gu07
6482	⟨3^{+},5^{+}⟩				20		⟨3275⟩	6382	13835	69Gu07
6541	⟨3^{+},5^{+}⟩				38		⟨3354⟩	6440	13893	69Gu07
6605	⟨0^{+}⟩						⟨3408⟩	6503	13956	69Gu07
6708	⟨0^{+}⟩				12		⟨3512⟩	6605	14058	69Gu07
6764	⟨3^{+},5^{+}⟩				36		⟨3564⟩	6660	14113	69Gu07
6958	⟨3^{+},5^{+}⟩				33		⟨3745⟩	6851	14304	69Gu07
7099	⟨3^{+},5^{+}⟩				37		⟨3903⟩	6990	14443	69Gu07
7197	⟨3^{+},5^{+}⟩				23		⟨4012⟩	7086	14539	69Gu07

Additional data on this isotope can be found in [88PaZN, 76Le09, 73Ho42, 72Ra23, 72Sz01, 64Le06].
* $(2J+1)\mathit{\Gamma}_{p}$ instead of $\mathit{\Gamma}_{p}$; comparison with $(2J+1)S_{dp}$ in ^{65}Ni is given [69Gu07].
Parameters of the IAR gross-structure $E_{\circ}$=3240(10) and 3520(10) keV ($\mathit{\Gamma}$=15 and 7.5 keV, $(2J+1)\mathit{\Gamma}_{p}$=8.6(17) and 2.6(8) keV), both with $2J^{\pi}=3^{-}$, are given in [66Ga14].
Radiative width $\mathit{\Gamma}_{\gamma}$ is considered to be negligible if compared with $\mathit{\Gamma}_{p}$ and $\mathit{\Gamma}_{n}$ ($\mathit{\Gamma}=\mathit{\Gamma}_{p}+\mathit{\Gamma}_{n}$).

Branching ratios of γ-transitions [73Ho42, 79Er10, 78Kr09]. Part 1. $^{65}_{29}$**Cu**(p)

E^{*} [keV]	$2J^{\pi}$	$E_{\circ}$ [keV]	Branching ratios Percentage											Ref.
E^{*}			0.0	771	1118	1482	1623	1725	2094	2212	2329	2533	3326	
$2J^{\pi}_{f}$			3^{-}	1^{-}	5^{-}	7^{-}	5^{-}	3^{-}	7^{-}	⟨1⟩$^{-}$	3^{-}			
770.64(9)	1^{-}		721*											
1115.55(1)	5^{-}		1000											
1481.83(3)	7^{-}		257*		53*									
1623.43(5)	5^{-}		134*	22*										
1725.00(5)	3^{-}		265*		101*									
2094.34(14)	⟨7⟩$^{-}$		46*		98*		12*							
2107.44(13)	⟨5⟩$^{-}$		32*	10*	62*	49*		5*						
2212.84(15)	⟨1⟩$^{-}$		51*	88*				13*						
2278.5(9)	⟨7⟩$^{-}$		9*											
2329.05(15)	3^{-}		89*	54*	43*									
2406.6(5)														
2525.74(21)	9^{+}					x								
2533.04(15)	1–5		53*	63*				12*						

(continued) $^{65}_{29}$**Cu**(p)

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage											Ref.
E^*			0.0	771	1118	1482	1623	1725	2094	2212	2329	2533	3326	
$2J_f^\pi$			3^-	1^-	5^-	7^-	5^-	3^-	7^-	$\langle 1\rangle^-$	3^-			
2533.9(4)	$7^+,9^+$					20*								
2593.4(4)	$1^-,5^-$								⟨48⟩*					
2620(8)														
2643.5(5)														
2649.67(13)	$5^-,7^-$		21*	76*	15*		7*	15*						
2654.9(3)														
2669.0(17)														
2752.8(19)	$7^+,9^+$					⟨11⟩*								
2839(3)	$7^+,9^+$													
2862.77(20)			⟨59⟩*											
2866.89(17)	3–7		43*				11*							
2874.47(20)	$\langle 3^-\rangle$		70*											
2894.49(17)	1–5		27*				11*							
2902.47(20)			45*											
3079.69(22)	$3^+,5^+$			59*	13*									
3240.3(22)	⟨1–5⟩				⟨39⟩*									
3261.1(20)	$1^-,5^-,7^-$		30*											
3631.9(15)	$1^+,3^+$		17*	⟨59⟩*										
3964(3)	$1^-,3^-$		27*											
4056(2)	⟨1–5⟩		32*											
4087(3)	⟨1–5⟩		20*											
8662		1235	26	12			20	6	19***	9	9			73Ho42
8758		1333	77						10***	9			7	73Ho42
8802		1379	3	39					15***	11	20	6	6	73Ho42
8962		1537	51	15	3	3	1			15	3	6	4	73Ho42
9058		1639	13	16	11				11***	11	38			73Ho42
9070		1649	12	23	7		2	4	29***	5	5	4	9	73Ho42
9135		1716	28	41	5		3	2	13***	1	2	4	1	73Ho42
9249		1833	18	13	7			42	20***					73Ho42
10575(10)														
10618(3)	$[1^-]$	3219**	100	10			6	76		14	15			78Kr09
			150	15			9	110		21	22			78Kr09

* normalized [79Er10] to I_γ=1000 for the strongest transition of the secondary γ-rays spectra
** normalized [78Kr09] to I_γ=100 for the ground state transition; partial radiative widths (in meV) are given in the second line under the branching ratios
*** transitions to the unknown states
Spectra were measured by three-crystal pair spectrometer with 40 cm^3 Ge(Li) detector as the central part of it and several proton energies (with 19 keV step).

Branching ratios of γ-transitions [78Kr09]. Part 2. $^{65}_{29}\mathbf{Cu}(\mathrm{p})$

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage									Com.	Ref.
E^* $2J^\pi_f$			2644	2656 7^-,5	2867	2990	2997	3080 3^+,5^+	3157	3449	3504	E^*, keV $2J^\pi_f$	
10618(3)	[1^-]	3219	17	10	58	13	13	36	28	25	13		78Kr09
			25	16	85	19	19	53	41	37	20		78Kr09

Branching ratios of γ-transitions [78Kr09]. Part 3. $^{65}_{29}\mathbf{Cu}(\mathrm{p})$

E^* [keV]	$2J^\pi$	$E_\circ$ [keV]	Branching ratios Percentage									Com.	Ref.
E^* $2J^\pi_f$			3740	3895 1^+	3925	3958	4056 ⟨1-5⟩	4087 ⟨1-5⟩	4119	4184	4244	E^*, keV $2J^\pi_f$	
10618(3)	[1^-]	3219	10	22	27	16	20	17	19	31	21		78Kr09
			14	32	40	23	29	25	28	45	30		78Kr09