

Energy levels and branching ratios [02Bu29].

⁶⁸₃₂Ge

E^*	J^π	σ (¹² C, ¹⁰ Be)	S_α	L	σ (p,t)	R	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		$\mu\text{b/sr}$	(⁶ Li,d)	(p,t)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
0	0 ⁺		3.40	0	3250	1.33	580	270.95(16) d	77Gu02
1015.80(16)	2 ⁺	22		2	250	1.45	170	1.8(2) ps	77Gu02
1755.0(3)	0 ⁺			0	19	0.012	<14		77Gu02
1777.47(16)	2 ⁺							4.2(7) ps	
2267.96(17)	4 ⁺			4	8.4	0.176		0.8(1) ps	77Gu02
2428.73(17)	3 ⁺							2.1(7) ps	
2457.28(16)	2 ⁺								
0+X	$\langle 14 \rangle$								
2617(3)	0 ⁺			0	61	0.048			77Gu02
2648.92(17)	3 ⁻	148		3	52	0.7	32	1.7(+14-10) ps	77Gu02
2832.12(17)	4 ⁺			4	40	0.91		0.8(+7-3) ps	77Gu02
2900.5(8)	$\langle 4^- \rangle$								
2947.3(4)	2 ⁺			2	20	0.24			77Gu02
3023.1(5)	2 ⁺			2	50	0.58			77Gu02
3040.65(18)	4 ⁺	116							
3062.01(17)	4 ⁺			$\langle 3 \rangle$	6	0.12			77Gu02
3086.9(4)	$\langle 1, 2^+ \rangle$								
3182.42(16)	4 ⁺			4	13.5	0.29			77Gu02
3204(3)	0 ⁺			0	20	0.019			77Gu02
3287.8(8)	$\langle 1, 2^+ \rangle$								
3400.4(4)	$\langle 1, 2^+ \rangle$								
3417.2(5)									
3474.6(11)	0 ⁺		0.16	0	71	0.074			80Ar14
3509.91(17)	4 ⁻								
3522.0(11)	2 ⁺			2	22	0.35			77Gu02
3582.17(17)	5 ⁻			$\langle 5+1 \rangle$				1.2(4) ps	77Gu02
3604(3)	4 ⁺			4	22.5	0.55			77Gu02
3631.44(20)	4,5								
3649.29(17)	5 ⁻	130		$\langle 4 \rangle$	5.5	0.15		1.4(+14-7) ps	77Gu02
3675.63(19)	5 ⁺								
3696.09(18)	6 ⁺							0.48(14) ps	
3735(3)	$\langle 2^+ \rangle$			$\langle 2 \rangle$	5.3	0.095			77Gu02
3809.3(11)	2 ⁺			2	52	1.1			77Gu02
3883.25(17)	6 ⁻							132(35) ps	
4021(3)	4 ⁺			4	6.3	0.19			77Gu02
4037(3)	$\langle 2^+ \rangle$			$\langle 2 \rangle$	8	0.15			77Gu02
4054.02(17)	7 ⁻	292						118(21) ps	
4078(3)	0 ⁺			0	16	0.021			77Gu02
4144.29(17)	6 ⁺								
1575.0+X	$\langle 16 \rangle$								
1620.0+X	$\langle 16 \rangle$								
4238.5(11)	$\langle 2^+ \rangle$			$\langle 2 \rangle$	8.5	0.14			77Gu02
4322(3)	2 ⁺			2	5.0	0.12			77Gu02
4358(3)	0 ⁺			0	25	0.038			77Gu02
4454.32(18)	7 ⁻			$\langle 6 \rangle$	10			0.97(21) ps	77Gu02

(continued)

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E^*	J^π	σ (¹² C, ¹⁰ Be)	S_α	L	σ (p,t)	R	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		$\mu\text{b/sr}$	(⁶ Li,d)	(p,t)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
4567.5(11)	$\langle 2^+ \rangle$			$\langle 2 \rangle$	6.1	0.17			77Gu02
4614(3)	$\langle 3^- \rangle$			$\langle 3 \rangle$	4.1	0.12			77Gu02
4659.9(2)	7^-	156							
4736(3)	0^+			0	4.5	0.009			77Gu02
4789(3)	0^+			0	4.1	0.01			77Gu02
4837.3(2)	8^+	210						1.0(2) ps	
4857(10)									
4878.0(11)									
4958.0(2)	8^-							0.9(2) ps	
5049.8(2)	8^+							0.5(1) ps	
5074(10)									
5149.1(2)	$\langle 8^- \rangle$							1.2(3) ps	
5217(10)									
5266.8(11)	7^+								
5330.4(2)	9^-							0.7(1) ps	
5366.4(2)	8^+							0.8(+3-2) ps	
5560(50)									
5678.4(2)	9^-							0.5(2) ps	
5822.1(2)	9^-							0.8(4) ps	
5873.7(2)	9^+							1.5(6) ps	
5962.0(2)	10^+							0.8(2) ps	
3425.0+X	$\langle 18 \rangle$								
6215.3(2)	10^+							<0.7 ps	
6300(50)									
6420.7(2)	10^-								
6556.9(2)	$\langle 10^- \rangle$								
6596.0(2)	10^+								
6663.6(2)	10^+								
6671.4(2)									
6960(50)									
7045.2(2)	11^-							1.0(3) ps	
7145.8(2)	$11^{\langle - \rangle}$								
7242.4(3)								0.7(+7-4) ps	
7251.6(2)	11^-								
7320.5(11)									
7371.6(2)	12^+							0.7(3) ps	
7496.3(2)	$\langle 11^- \rangle$								
7517.3(2)	12^+								
7533(1)	12^+								
7559.8(2)	12^+							0.8(4) ps	
7762.3(2)	12^+								
7882(1)									
5440.1+X	$\langle 20 \rangle$								
8043.8(2)	13^+								
8172.3(2)	13^-								

(continued)

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E^*	J^π	σ (¹² C, ¹⁰ Be)	S_α	L	σ (p,t)	R	σ (p,t)	$T_{1/2}$ or Ref.
[keV]		$\mu\text{b/sr}$	(⁶ Li,d)	(p,t)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}
8622(1)								
8661.0(2)	14 ⁺							
8663.7(11)								
8781.7(11)								
8790.7(2)	15 ⁽⁻⁾							
8868.7(2)	14 ⁽⁻⁾							
8931.4(4)	$\langle 14^+ \rangle$							
9012.5(6)	14 ⁺							
9112.9(6)	14 ⁺							
9168.3(13)	14 ⁺							
9386.9(2)	15 ⁽⁻⁾							
9419.4(15)	14 ⁺							
9564.3(8)	15 ⁽⁻⁾							
9606.2(8)	15 ⁺							
9804.0(3)	$\langle 16^+ \rangle$							
10025.06(10)								
10127.0(8)	16 ⁽⁻⁾							
10218.0(3)	16 ⁺							
7677.1+X	$\langle 22 \rangle$							
10295.9(3)	17 ⁽⁻⁾							
10493.8(6)	16 ⁽⁻⁾							
10664.3(8)	16 ⁺							
10666.0(7)	17 ⁽⁻⁾							
10689.2(11)								
10895.6(8)	16 ⁺							
10897.4(12)								
10927.4(5)	17 ⁽⁻⁾							
10958.2(8)	16 ⁺							
10988.3(17)	16 ⁺							
10988.5(7)	16 ⁺							
10990.2(13)	17 ⁺							
11086.1(17)	16 ⁺							
11358.3(5)	$\langle 18^+ \rangle$							
11406.8(11)								
11417.9(17)	16 ⁺							
11543.1(19)								
11793.8(13)								
11794.6(11)								
11832.6(11)	20 ⁽⁻⁾							
11994.8(7)	18 ⁺							
12137.2(3)	19 ⁽⁻⁾							
12165.3(9)	19 ⁽⁻⁾							
12246.1(7)	18 ⁺							
12262.8(9)	18 ⁽⁻⁾							
12363.7(7)	19 ⁽⁻⁾							

(continued)

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E^*	J^π	σ (¹² C, ¹⁰ Be)	S_α	L	σ (p,t)	R	σ (p,t)	$T_{1/2}$ or	Ref.
[keV]		$\mu\text{b/sr}$	(⁶ Li,d)	(p,t)	$\mu\text{b/sr}$	(p,t)	$\mu\text{b/sr}$	Γ_{cm}	
12502.1(13)									
12536.2(11)									
12642(2)	18 ⁺								
12652.6(13)	18 ⁽⁻⁾								
12719.9(20)	18 ⁺								
10126.2+X	⁽²⁴⁾								
12779.4(13)									
12817.6(16)	19 ⁺								
12884.4(13)									
13104.7(11)									
13265.7(11)									
13617.8(12)									
13751.7(11)									
13953.2(12)	20 ⁺								
13991.4(12)									
14085.8(8)	20 ⁽⁻⁾								
14116.8(12)	20 ⁺								
14361.3(11)									
14402.2(11)	21 ⁽⁻⁾								
14426.9(16)	⁽²¹⁾								
14485.9(9)	21 ⁽⁻⁾								
14505.3(19)	21 ⁺								
14560.4(6)	⁽²¹⁾								
12815.2+X	⁽²⁶⁾								
15563.1(16)	22 ⁺								
15835.2(16)	22 ⁺								
16130.9(13)	22 ⁽⁻⁾								
16734.4(22)	23 ⁺								
17360.9(22)									
17496.3(15)	23 ⁽⁻⁾								
18022.2(19)	24 ⁺								
18132.9(16)	24 ⁽⁻⁾								
18274.2(19)									
19785.5(24)	25 ⁺								
20356.9(19)	26 ⁽⁻⁾								
20821.3(21)	26 ⁺								
22959.0(22)	28 ⁽⁻⁾								
		90Bo27	80Ar14		77Gu02	77Gu02	74Ba67		Ref.

Additional data on this isotope can be found in [01Wa02, 00Si38, 92He16, 91Ch50, 91Ch14, 90Bo27].

Cross section of two-proton transfer reaction σ (¹²C, ¹⁰Be) on ⁶⁶Zn was measured at 10° [90Bo27]. For two-neutron pickup reaction cross section σ (p,t) at 10° (for $L=0$) and a ratio $R=\sigma_{exp}/\sigma_{DWBA}$ can be used for a relative comparison of data for the same J^π [77Gu02].

Energy levels and branching ratios [02Bu29]. Part 2

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E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : 0 J_f^π : 0 ⁺	1016 2 ⁺	1755 0 ⁺	1777 2 ⁺	2268 4 ⁺	2429 3 ⁺	2457 2 ⁺	0+X ⟨14⟩	2648.9 3 ⁻	2832.1 4 ⁺
1015.80(16)	2 ⁺	100									
1755.0(3)	0 ⁺		100								
1777.47(16)	2 ⁺	30.7(12)	69(3)								
2267.96(17)	4 ⁺		100								
2428.73(17)	3 ⁺		26.7(14)		73(4)						
2457.28(16)	2 ⁺	50.6(33)	11.1(13)	14.5(9)		23.8(18)					
2648.92(17)	3 ⁻		95.0(34)		5.01(21)						
2832.12(17)	4 ⁺		21.6(8)		71.7(22)	4.9(4)	1.8(2)				
2900.5(8)	⟨4 ⁻ ⟩									100	
2947.3(4)	2 ⁺				100						
3023.1(5)	2 ⁺		88(8)		12(2)						
3040.65(18)	4 ⁺		3.5(5)		33(2)		63(4)				
3062.01(17)	4 ⁺		38(13)			46(13)	8(13)			x	8(13)
3086.9(4)	⟨1,2 ⁺ ⟩	33(3)	10(3)	38(3)	18(3)						
3182.42(16)	4 ⁺		13.2(6)		48(2)	10(1)		29(1)			
3287.8(8)	⟨1,2 ⁺ ⟩	29(7)	71(7)								
3400.4(4)	⟨1,2 ⁺ ⟩	4(1)	15(1)	16(1)	65(4)						
3417.2(5)					63(3)		37(3)				
3474.6(11)	0 ⁺		100								
3509.91(17)	4 ⁻						61(3)			39(2)	
3522.0(11)	2 ⁺		100								
3582.17(17)	5 ⁻					74(2)				16.4(5)	9.9(3)
3631.44(20)	4,5									100	
3649.29(17)	5 ⁻					81(2)				10.3(3)	2.1(12)
3675.63(19)	5 ⁺						78(4)				22.2(16)
3696.09(18)	6 ⁺					100					
3809.3(11)	2 ⁺		100								
4144.29(17)	6 ⁺					34(1)					18.1(7)
1620.0+X	⟨16⟩								100		
4238.5(11)	⟨2 ⁺ ⟩		100								
4567.5(11)	⟨2 ⁺ ⟩		100								
4878.0(11)										100	

Energy levels and branching ratios [02Bu29]. Part 3

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E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : 2900.5 J_f^π : ⟨4 ⁻ ⟩	3062.0 4 ⁺	3182.4 4 ⁺	3509.9 4 ⁻	3582.2 5 ⁻	3631.4 4,5	3649.3 5 ⁻	3676 5 ⁺	3696 6 ⁺	3883.2 6 ⁻
3582.17(17)	5 ⁻		x								
3649.29(17)	5 ⁻		6.9(12)								
3883.25(17)	6 ⁻	1.28(5)			1.39(5)		x	96.4(31)	1.0(15)		
4054.02(17)	7 ⁻					20.8(7)		13.9(4)		13.3(4)	52.0(15)

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E^*	J^π	Branching ratios in percentage									
[keV]	E_f^* : J_f^π :	2900.5 $\langle 4^- \rangle$	3062.0 4^+	3182.4 4^+	3509.9 4^-	3582.2 5^-	3631.4 4,5	3649.3 5^-	3676 5^+	3696 6^+	3883.2 6^-
4144.29(17)	6^+			45.5(14)						2.9(2)	
4454.32(18)	7^-					19.5(6)		5.3(39)			14.8(5)
4659.9(2)	7^-										16.8(6)
4837.3(2)	8^+									81(2)	
4958.0(2)	8^-										71(3)
5049.8(2)	8^+									76(3)	
5149.1(2)	$\langle 8^- \rangle$										12.8(6)
5266.8(11)	7^+								100		
5366.4(2)	8^+									55(2)	

Energy levels and branching ratios [02Bu29]. Part 4

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E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	4054 7^-	4144.3 6^+	1575+X $\langle 16 \rangle$	1620+X $\langle 16 \rangle$	4454 7^-	4659.8 7^-	4837.2 8^+	4958.0 8^-	5049.8 8^+
4454.32(18)	7^-		60(2)								
4659.9(2)	7^-		83(3)			x					
4837.3(2)	8^+		14.7(5)	4.59(15)							
4958.0(2)	8^-		29(9)								
5049.8(2)	8^+		5.5(2)	15.7(5)				2.53(9)			
5149.1(2)	$\langle 8^- \rangle$		81(3)			x	6.0(2)				
5330.4(2)	9^-		100								
5366.4(2)	8^+			39(15)						6.3(4)	
5678.4(2)	9^-		3(3)			75(3)			11.1(4)		
5822.1(2)	9^-						44(1)	11(5)			15.3(4)
5873.7(2)	9^+							100			
5962.0(2)	10^+							94.8(28)			
3425.0+X	$\langle 18 \rangle$			x	x						
6215.3(2)	10^+							15.3(5)		82.0(23)	
6420.7(2)	10^-								100		
6556.9(2)	$\langle 10^- \rangle$										x
6596.0(2)	10^+							22(22)			

Energy levels and branching ratios [02Bu29]. Part 5

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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	5330.4 9 ⁻	5366.4 8 ⁺	5678.4 9 ⁻	5822.1 9 ⁻	5873.7 9 ⁺	5962.0 10 ⁺	3425+X ⟨18⟩	6215.3 10 ⁺	6420.7 10 ⁻	6556.9 ⟨10 ⁻ ⟩
5678.4(2)	9 ⁻		10.5(3)									
5822.1(2)	9 ⁻		29.6(9)									
5962.0(2)	10 ⁺		5.15(15)									
6215.3(2)	10 ⁺			2.66(11)								
6556.9(2)	⟨10 ⁻ ⟩	x										
6596.0(2)	10 ⁺			78(3)								
6663.6(2)	10 ⁺						100					
6671.4(2)				100								
7045.2(2)	11 ⁻	100										
7145.8(2)	11 ^{⟨-⟩}				97.3(33)							2.74(13)
7242.4(3)				100								
7251.6(2)	11 ⁻	2.83(13)			24.3(7)	48.2(13)		18.2(21)				6.5(2)
7371.6(2)	12 ⁺							100				
7496.3(2)	⟨11 ⁻ ⟩				77.7(26)						22.3(12)	
7517.3(2)	12 ⁺									100		
7533(1)	12 ⁺							100				
7559.8(2)	12 ⁺							14.6(5)		80.7(22)		
7762.3(2)	12 ⁺							77.2(24)				
7882(1)								100				
5440.1+X	⟨20⟩								100			

Energy levels and branching ratios [02Bu29]. Part 6

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E^*	J^π	Branching ratios in percentage										
		E_f^* :	6596.0	7045.2	7145.7	7251.6	7320.5	7371.6	7496.3	7517.3	7533.0	7559.8
[keV]		J_f^π :	10^+	11^-	$11^{(\neg)}$	11^-		12^+	$\langle 11^- \rangle$	12^+	12^+	12^+
7559.8(2)	12^+		4.73(17)									
7762.3(2)	12^+									7.1(3)		15.7(5)
8043.8(2)	13^+						25(8)	63.1(20)				
8172.3(2)	13^-			12.0(4)	20.9(8)	52.8(15)		7.2(2)	1.71(6)	3.54(10)		x
8622(1)												100
8661.0(2)	14^+									26.7(8)		58.6(18)
8663.7(11)				100								
8781.7(11)				100								
8931.4(4)	$\langle 14^+ \rangle$							100				
9012.5(6)	14^+									87.3(26)		12.7(4)
9112.9(6)	14^+									32.2(14)		
9168.3(13)	14^+							x				
9419.4(15)	14^+										100	

Energy levels and branching ratios [02Bu29]. Part 7

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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	7762.3 12 ⁺	5440+X ⟨20⟩	8043.8 13 ⁺	8172.3 13 [−]	8661.0 14 ⁺	8790.7 15 ^{⟨−} ⟩	8868.7 14 ^{⟨−} ⟩	9012.5 14 ⁺	9112.9 14 ⁺	9168.3 14 ⁺
8043.8(2)	13 ⁺		11.6(4)									
8172.3(2)	13 [−]		1.73(6)									
8661.0(2)	14 ⁺		14.7(48)									
8790.7(2)	15 ^{⟨−} ⟩					100						
8868.7(2)	14 ^{⟨−} ⟩				32.8(12)	67.2(20)						
9112.9(6)	14 ⁺				67.8(24)							
9168.3(13)	14 ⁺	x										
9386.9(2)	15 ^{⟨−} ⟩					83.3(28)		16.7(5)				
9564.3(8)	15 ^{⟨−} ⟩						100					
9606.2(8)	15 ⁺				57.6(18)		42.4(14)					
9804.0(3)	⟨16 ⁺ ⟩						100					
10025.06(10)							x					x
10127.0(8)	16 ^{⟨−} ⟩							100				
10218.0(3)	16 ⁺						87.2(27)	12.8(57)				
7677.1+X	⟨22⟩			100								
10295.9(3)	17 ^{⟨−} ⟩							95.1(27)				
10493.8(6)	16 ^{⟨−} ⟩							47.3(17)	33.5(11)			
10664.3(8)	16 ⁺									100		
10689.2(11)								100				
10895.6(8)	16 ⁺						48(2)					52(2)
10897.4(12)										100		
10927.4(5)	17 ^{⟨−} ⟩							17(9)				
10958.2(8)	16 ⁺										100	
10988.3(17)	16 ⁺											100
10988.5(7)	16 ⁺						18.0(8)			42.2(16)	39.8(15)	
11406.8(11)								100				

Energy levels and branching ratios [02Bu29]. Part 8

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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	9386.9 15 ⁽⁻⁾	9419.4 14 ⁺	9564.3 15 ⁽⁻⁾	9606.2 15 ⁺	9804.0 ⟨16 ⁺ ⟩	10127.0 16 ⁽⁻⁾	10218 16 ⁺	7677+X ⟨22⟩	10296 17 ⁽⁻⁾	10664 16 ⁺
10295.9(3)	17 ⁽⁻⁾	4.92(16)										
10493.8(6)	16 ⁽⁻⁾	19.1(9)										
10666.0(7)	17 ⁽⁻⁾	86.2(28)									13.8(64)	
10927.4(5)	17 ⁽⁻⁾	32.2(10)			31.7(10)			16.1(5)			2.9(2)	
10990.2(13)	17 ⁺					100						
11086.1(17)	16 ⁺			100								
11358.3(5)	⟨18 ⁺ ⟩						100					
11417.9(17)	16 ⁺			100								
11793.8(13)								100				
11794.6(11)											100	

(continued)

⁶⁸Ge
₃₂

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	9386.9 15 ⁽⁻⁾	9419.4 14 ⁺	9564.3 15 ⁽⁻⁾	9606.2 15 ⁺	9804.0 16 ⁽⁻⁾	10127.0 16 ⁽⁻⁾	10218 16 ⁺	7677+X 17 ⁽⁻⁾	10296 17 ⁽⁻⁾
11832.6(11)	20 ⁽⁻⁾									100	
11994.8(7)	18 ⁺							60(7)			9.4(4)
12137.2(3)	19 ⁽⁻⁾									75.7(23)	
12165.3(9)	19 ⁽⁻⁾									100	
12246.1(7)	18 ⁺									14.7(5)	38.3(13)
12262.8(9)	18 ⁽⁻⁾									100	
12363.7(7)	19 ⁽⁻⁾									35(12)	
12502.1(13)											x
12536.2(11)								x			
12652.6(13)	18 ⁽⁻⁾						100				
10126.2+X	17 ⁽⁻⁾								100		
12779.4(13)											x
12884.4(13)											100
13104.7(11)										100	
13265.7(11)										100	
13751.7(11)										x	

Energy levels and branching ratios [02Bu29]. Part 9

⁶⁸Ge
₃₂

E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	10666 17 ⁽⁻⁾	10896 16 ⁺	10927 17 ⁽⁻⁾	10958 16 ⁺	10990 17 ⁺	11086 16 ⁺	11418 16 ⁺	11543	11995 18 ⁺	12137 19 ⁽⁻⁾
11994.8(7)	18 ⁺					8.7(4)						
12137.2(3)	19 ⁽⁻⁾		24.3(8)									
12246.1(7)	18 ⁺			25.0(8)		22.0(13)						
12363.7(7)	19 ⁽⁻⁾				65(3)							
12642(2)	18 ⁺							50	50			
12719.9(20)	18 ⁺							100				
12817.6(16)	19 ⁺						45(9)			55(9)		
13617.8(12)											100	
13991.4(12)											100	
14085.8(8)	20 ⁽⁻⁾											61.8(19)
14116.8(12)	20 ⁺										100	
14361.3(11)												x
14402.2(11)	21 ⁽⁻⁾											100
14485.9(9)	21 ⁽⁻⁾											21(18)

Energy levels and branching ratios [02Bu29]. Part 10

⁶⁸₃₂Ge

E^*	J^π	Branching ratios in percentage										
		E_f^* :	12165	12246	12263	12364	10126+X	12818	13953	14086	14117	14402
[keV]		J_f^π :	19 ⁽⁻⁾	18 ⁺	18 ⁽⁻⁾	19 ⁽⁻⁾	⁽²⁴⁾	19 ⁺	20 ⁺	20 ⁽⁻⁾	20 ⁺	21 ⁽⁻⁾
13953.2(12)	20 ⁺			100								
14085.8(8)	20 ⁽⁻⁾		12.8(7)		25(32)							
14485.9(9)	21 ⁽⁻⁾					79(18)						
14505.3(19)	21 ⁺							100				
12815.2+X	⁽²⁶⁾						100					
15563.1(16)	22 ⁺										100	
15835.2(16)	22 ⁺								100			
16130.9(13)	22 ⁽⁻⁾									71.9(22)		
17496.3(15)	23 ⁽⁻⁾											100

Energy levels and branching ratios [02Bu29]. Part 11

⁶⁸₃₂Ge

E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	14427 $\langle 21 \rangle$	14505 21^+	15835 22^+	16131 $22^{\langle - \rangle}$	16734 23^+	18022 24^+	18133 $24^{\langle - \rangle}$	20357 $26^{\langle - \rangle}$	10988
11994.8(7)	18^+										21.7(7)
16130.9(13)	$22^{\langle - \rangle}$		28.1(10)								
16734.4(22)	23^+			100							
17360.9(22)				x							
18022.2(19)	24^+				100						
18132.9(16)	$24^{\langle - \rangle}$					100					
18274.2(19)					100						
19785.5(24)	25^+						100				
20356.9(19)	$26^{\langle - \rangle}$								100		
20821.3(21)	26^+							100			
22959.0(22)	$28^{\langle - \rangle}$									100	

Energy levels and branching ratios [00Bh05].

⁶⁹₃₂Ge

E^*	$2J^\pi$	C^2S	L	C^2S	L	C^2S	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(τ ,t)		(p,d)		(d,t)		(τ , α)	Γ_{cm}		E_{f}^* : $2J_{\text{f}}^\pi$:	0 5 ⁻	86.8 1 ⁻	233 3 ⁻	374 3 ⁻	398 9 ⁺
0	5 ⁻	6.0(12)	3	3.80	3	3.24(81)	3	3.4	39.05(10) h	77Bi08						
86.765(14)	1 ⁻	1.1(2)	1	0.56	1	0.61(15)	$\langle 3 \rangle$	0.6	5.1 μs	75ShYV		100				
232.694(15)	3 ⁻	0.4(1)	1	0.10	1	0.07(2)	$\langle 1 \rangle$	0.2	176(12) ps	75ShYV		67(2)	32.6(9)			
373.954(17)	3 ⁻	6.9(14)	1	1.67	1	1.67(42)	1	3.9		75ShYV		23(1)	74(1)	3.4(6)		
397.944(18)	9 ⁺			4	0.95				2.81 μs	75ShYV		100				
812.186(21)	5 ⁺		2	0.09	2	0.09(2)				75ShYV		64(3)		3	22(3)	12(2)
862.019(25)	7 ⁻								2.1(6) ps			91(3)		8(2)	0.7(1)	1.0(1)

(continued)

⁶⁹₃₂Ge

E^*	$2J^\pi$	C^2S	L	C^2S	L	C^2S	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]		(τ, t)		(p,d)		(d,t)		(τ, α)	Γ_{cm}		E_f^* : 0	86.8	233	374	398
											$2J_f^\pi$: 5 ⁻	1 ⁻	3 ⁻	3 ⁻	9 ⁺
933.142(23)	5 ⁻								1.5(7) ps		61(3)	15(4)	5	20(4)	
994.92(4)	1 ⁻	1.2(2)	1	0.32	1	0.25(6)	1	0.7	0.6(1) ps	75ShYV	67(14)		27(6)	6(4)	
1068.01(10)	$\langle 5^+ \rangle$										86(9)				
1159.90(3)	3 ⁻		1	0.06	1	0.04(1)			1.2(6) ps	75ShYV	14(2)	70(2)	16(2)		
1195.72(3)	5 ⁻								0.97(21) ps		33(2)		9(2)	58(5)	
1203.5(5)															
1210.11(5)	7 ⁺										4.8(3)				90(6)
1278.38(5)	1 ⁻ , 3 ⁻		1	0.02					1.8(12) ps	75ShYV	15	22	24	38	
1306.90(4)	3 ⁻		1	0.08	1	0.05(1)			0.50(17) ps	75ShYV	37(2)	40(2)	5(3)	18(9)	
1350.60(3)	11 ⁺								0.56(6) ps						100
1407.20(3)	13 ⁺								1.4(2) ps						100
1414.77(5)	5 ⁻		3	0.28	3	0.17(6)			0.97(42) ps	75ShYV	62(7)		14(4)	24(4)	
1430.18(6)	9 ⁻								0.60(10) ps		96(5)				
1432.63(7)	3 ⁺								1.4(5) ps			3	6	16	
1438(2)	$\langle 1^+ \rangle$				$\langle 0 \rangle$	0.01(1)				77Bi08					
1465.96(5)	9 ⁺		4	0.09	4	0.66(23)			2.1(14) ps	75ShYV					77
1478.72(6)	7 ⁻		3	0.95	3	0.21(7)			0.30(8) ps	75ShYV	72(18)		4.6(1)	18(9)	
1539.25(9)	3 ⁻		1	0.03	1	0.02(1)			0.35(14) ps	75ShYV	71(3)	29(9)	≤ 17	< 38	
1590.82(9)	7 ⁺								0.66(20) ps						57
1601.34(6)	5 ⁺								0.52(17) ps		21(1)			10(1)	
1610.93(7)	5 ⁻		3	0.25	$\langle 3 \rangle$	0.24(8)				75ShYV	30(3)		56(1)	15(3)	
1613.27(7)	7 ⁻								> 0.7 ps		39(1)		49(1)	6(3)	
1666.32(9)	1 ⁽⁻⁾												100	≤ 10	
1725.8(3)	1 ⁻ , 3 ⁻		1	0.03	1	0.07(3)				75ShYV	18	52		30	
1763.45(22)	1 ⁺		0	0.12	[0]	0.02(1)				75ShYV		48		52(26)	
1767.12(13)	3 ⁻										34(4)	29(2)	37(2)		
1882.41(11)	5 ⁽⁻⁾												100		
1891.00(16)	3 ⁻		1	0.02						75ShYV	26(2)	40(4)	34(2)		
1907(6)															
1919.64(8)	7 ⁻												30(2)		
1920.28(7)	9 ⁻								> 1.0 ps		40(5)				
1989(5)	3 ⁺ , 5 ⁺		2	0.02						75ShYV					
2000.7(3)	5 ⁻										100				
2009.87(20)	3 ⁻													100	
2012.53(8)	5 ⁻												46(15)		
2018.10(4)	13 ⁺								1.6(2) ps						18(4)
2025.21(9)	5 ⁺														
2057.56(9)	5 ⁽⁻⁾												47(5)		
2067.50(10)	5 ⁻												100		
2091(4)	1 ⁺		0	0.02	[0]	0.02(1)				75ShYV					
2106(4)	1 ⁻ , 3 ⁻		1	0.16	1	0.11(4)				75ShYV					
2119.22(8)	11 ⁺														38(1)
2143.5(3)	7 ⁺ , 9 ⁺		4	0.30	4	0.29(7)				75ShYV					
2148.58(6)	9 ⁻														
2151.23(10)	9 ⁺														

(continued)

⁶⁹₃₂Ge

E^*	$2J^\pi$	C^2S	L	C^2S	L	C^2S	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]		(τ, t)		(p,d)		(d,t)		(τ, α)	Γ_{cm}		E_f^* : 0	86.8	233	374	398
											$2J_f^\pi$: 5 ⁻	1 ⁻	3 ⁻	3 ⁻	9 ⁺
2178.23(15)	7 ⁺														
2194(4)	1 ⁻ , 3 ⁻		1	0.03						75ShYV					
2223.17(6)	9 ⁻										19(6)				
2236.4(3)	3 ⁻											67(3)			
2246.70(16)	5 ⁻										14(1)		57(5)	9(2)	
2248.15(7)	11 ⁻								0.49(28) ps						
2258.10(8)	9 ⁻														
2353.74(17)	5 ⁻		3	0.15						75ShYV					
2359(4)	1 ⁻ , 3 ⁻		1	0.04						75ShYV					
2370.14(11)	5 ⁻		3	0.08						75ShYV					
2386.52(18)	9 ⁻														
2395(4)	7 ⁺ , 9 ⁺		$\langle 4 \rangle$	0.22						75ShYV					
2462.13(15)	11 ⁻														
2483.16(6)	15 ⁺								0.82(22) ps						
2500.46(15)	5 ⁻														
2552.29(12)	11 ⁻														
2553.83(13)	7 ⁺														
2569.71(9)	7 ⁻														
2584.59(19)															
2589.67(21)	13 ⁺														
2594.55(24)	3 ⁻ , 5 ⁻											21(3)	40(7)		
2604.06(19)													100		
2615.36(14)	11 ⁺														
2617(5)	1 ⁻ , 3 ⁻		1	0.01						75ShYV					
2621.18(14)	$\langle 9^+ \rangle$														
2637.51(10)	9 ⁺														
2638.77(11)	9 ⁺														
2654.72(22)															
2730.06(9)	13 ⁻														
2735.35(21)	3 ⁻		1	0.1						75ShYV	39(8)		22(2)		
2755.07(5)	17 ⁺								0.6(1) ps						
2772.89(24)	5 ⁻		3	0.12						75ShYV		35(17)		65(6)	
2812(7)	1 ⁻ , 3 ⁻		1	0.03						75ShYV					
2814.81(9)	13 ⁻														
2834.09(8)	13 ⁻														
2856.24(18)	5 ⁻ , 7 ⁻		3	0.08						75ShYV					
2869.3(3)															
2887.3(3)															
2902.31(8)	15 ⁺														
2909.94(23)															
2946.7(4)											66(5)				
2959(5)	1 ⁻ , 3 ⁻		1	0.02						75ShYV					
2980.62(24)	7 ⁻		$\langle 2 \rangle$	0.03						75ShYV					50(6)
3073(5)	3 ⁺ , 5 ⁺		$\langle 2 \rangle$	0.02						75ShYV					
3075.80(5)	11 ⁻														

(continued)

⁶⁹Ge
₃₂

E^*	$2J^\pi$	C^2S	L	C^2S	L	C^2S	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(τ, t)		(p, d)		(d, t)		(τ, α)	Γ_{cm}		E_f^* :	0	86.8	233	374	398
											$2J_f^\pi$:	5 ⁻	1 ⁻	3 ⁻	3 ⁻	9 ⁺
3075.84(19)	15 ⁻								0.39(7) ps							
3092.4(3)	11 ⁻															
3095.2(3)																
3144.31(11)	9 ⁻															
3157.25(6)	17 ⁺								1.0(3) ps							
3173(5)	5 ⁻ , 7 ⁻		3	0.18						75ShYV						
3207.84(9)	15 ⁺															
3232(5)	1 ⁻ , 3 ⁻		1	0.02						75ShYV						
3256.1(3)																
3291.70(21)																
3343.28(15)	7 ⁻															
3361.26(25)																
3374(5)																
3395.88(11)	15 ⁻															
3410(5)	5 ⁻ , 7 ⁻		3	0.09						75ShYV						
3433.2(3)	3 ⁻ –7 ⁻															
3460(5)	⟨7 ⁺ , 9 ⁺ ⟩		⟨4⟩	0.13						75ShYV					23(2)	
3482(5)																
3508.21(9)	15 ⁺															
3519.54(21)																
3541.1(3)	7 ⁻															
3559.99(16)																
3562.0(3)	11 ⁺															
3605.06(11)	17 ⁻								2(1) ps							
3615(7)	1 ⁻ , 3 ⁻		1	0.01						75ShYV						
3622(7)																
3636.82(21)																
3645.09(10)	11 ⁻															
3666.76(8)	17 ⁻															
3680(7)	1 ⁻ , 3 ⁻		1	0.02						75ShYV						
3721.57(21)																
3729(7)																
3749.11(5)	19 ⁻								6.5(6) ps							
3759.7(3)																
3798(7)	5 ⁻ , 7 ⁻		3	0.22						75ShYV						
3813.69(13)	13 ⁻															
3828(7)																
3925.9(3)	15 ⁺															
3940.02(21)	13 ⁺															
3956.14(16)	13 ⁺															
3963.84(9)																
3990.5(4)																
4067.86(7)	19 ⁻															
4107.7(3)																
4267.10(8)	21 ⁻								3.2(3) ps							

(continued)

⁶⁹Ge
₃₂

E^*	$2J^\pi$	C^2S	L	C^2S	L	C^2S	L	C^2S	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]		(τ, t)		(p,d)		(d,t)		(τ, α)	Γ_{cm}		E_f^* :	0	86.8	233	374	398
											$2J_f^\pi$:	5 ⁻	1 ⁻	3 ⁻	3 ⁻	9 ⁺
4305.71(14)	21 ⁽⁺⁾								0.6(3) ps							
4493.5(3)																
4566.36(13)																
4594.26(8)	23 ⁻								13.6(3) ps							
4714.75(11)																
4837.06(23)																
5006.2(3)	$\langle 25^- \rangle$															
5089.8(3)																
5467																
5593.02(13)	23 ⁻															
5737.80(11)																
5802																
5834.76(12)	27 ⁻								3.5(6) ps							
5841.7(5)																
5897.93(24)	$\langle 25^+ \rangle$								<0.3 ps							
6041.84(13)																
6086.83(14)																
6291.71(13)	$\langle 25^+ \rangle$															
6504.2(8)																
6548.45(14)	$\langle 25^+ \rangle$															
6591.1(6)																
6839.54(11)	25 ⁽⁻⁾								1.5(4) ps							
7000(50)	1 ⁻ , 3 ⁻	0.4(1)								88Ch38						
7147.55(13)	29 ⁽⁺⁾															
7405.5(4)																
7412.4(4)																
7578.5(2)	29 ⁽⁻⁾								3(2) ps							
7780.2(2)	31 ⁽⁻⁾								0.2(1) ps							
7903.6(2)	33 ⁽⁺⁾								0.8(4) ps							
8708.8(3)	$\langle 33^- \rangle$															
9012.3(2)	$\langle 35^- \rangle$															
9182.3(2)	$\langle 37^+ \rangle$															
				77Bi08		77Bi08		67Fo05		Ref.						
				75ShYV						Ref.						
				00Bh05						Ref.						

Additional data on this isotope can be found in [88Ch38, 67Fo05].

Values C^2S for (p,d) reaction have been calculated for $J=5/2$ when $L=2$ or 3 and $J=9/2$ when $L=4$. For $L=1$ C^2S is assumed to be independent of J [75ShYV, 00Bh05, 77Bi08].

Energy levels and branching ratios [00Bh05]. Part 2

⁶⁹Ge
₃₂

E^* [keV]	$2J^\pi$	E_f^* : $2J_f^\pi$:	812 5 ⁺	862 7 ⁻	933 5 ⁻	Branching ratios in percentage						
						994.9 1 ⁻	1195.7 5 ⁻	1210.1 7 ⁺	1306.9 3 ⁻	1350.6 11 ⁺	1407.2 13 ⁺	1414.8 5 ⁻
1068.01(10)	⟨5 ⁺ ⟩		14(4)									
1203.5(5)			100									
1210.11(5)	7 ⁺		5(2)									
1430.18(6)	9 ⁻			4(1)								
1432.63(7)	3 ⁺		75									
1465.96(5)	9 ⁺		11(1)	2.9(6)				8.7(2)		1.3(6)		
1478.72(6)	7 ⁻				5.9(1)							
1590.82(9)	7 ⁺		43									
1601.34(6)	5 ⁺		48(1)					21(1)				
1613.27(7)	7 ⁻				6							
1763.45(22)	1 ⁺		<35									
1919.64(8)	7 ⁻				22(2)		36(5)					
1920.28(7)	9 ⁻			48(7)			7(1)					
2012.53(8)	5 ⁻						31(15)					23(3)
2018.10(4)	13 ⁺									75(3)	3.9(2)	
2025.21(9)	5 ⁺		13(4)					45(1)				
2057.56(9)	5 ^{⟨-⟩}			53								
2067.50(10)	5 ⁻						<100					
2119.22(8)	11 ⁺							11(1)			51(1)	
2148.58(6)	9 ⁻			32(1)	43(1)							12(1)
2151.23(10)	9 ⁺							72(4)		28(4)		
2178.23(15)	7 ⁺		100									
2223.17(6)	9 ⁻			11(1)	≤6		18(1)					
2236.4(3)	3 ⁻				8(3)	25(10)						
2246.70(16)	5 ⁻		20(2)									
2248.15(7)	11 ⁻			97(10)								
2258.10(8)	9 ⁻			27(13)	61(1)		<7					12(2)
2353.74(17)	5 ⁻			100								
2370.14(11)	5 ⁻			41(2)			15(9)					
2386.52(18)	9 ⁻			<56								
2483.16(6)	15 ⁺									47(10)	51(13)	
2500.46(15)	5 ⁻			32(4)								
2552.29(12)	11 ⁻			43(2)								
2569.71(9)	7 ⁻			100								
2584.59(19)				100								
2594.55(24)	3 ⁻ , 5 ⁻							40(7)				
2615.36(14)	11 ⁺									36(3)	32(16)	
2638.77(11)	9 ⁺									13(4)		
2735.35(21)	3 ⁻											39(8)
2755.07(5)	17 ⁺										100	
2814.81(9)	13 ⁻									32(1)	49(5)	
2834.09(8)	13 ⁻									77(7)	13(7)	
2869.3(3)				100								
2902.31(8)	15 ⁺									43(1)	32(1)	
2946.7(4)								34				

(continued)

⁶⁹₃₂Ge

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	812 5 ⁺	862 7 ⁻	933 5 ⁻	994.9 1 ⁻	1195.7 5 ⁻	1210.1 7 ⁺	1306.9 3 ⁻	1350.6 11 ⁺	1407.2 13 ⁺	1414.8 5 ⁻
2980.62(24)	7 ⁻		50(6)									
3075.84(19)	15 ⁻										67(8)	
3095.2(3)											100	
3144.31(11)	9 ⁻										14(2)	
3207.84(9)	15 ⁺									38(2)	15(2)	
3256.1(3)											100	
3361.26(25)											100	
3433.2(3)	3 ⁻ -7 ⁻				44(11)							
3508.21(9)	15 ⁺										21(1)	
3519.54(21)										100		
3562.0(3)	11 ⁺										100	
3749.11(5)	19 ⁻										0.3(3)	

Energy levels and branching ratios [00Bh05]. Part 3

⁶⁹₃₂Ge

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1430.2 9 ⁻	1432.6 3 ⁺	1466.0 9 ⁺	1478.7 7 ⁻	1590.8 7 ⁺	1610.9 5 ⁻	1613.3 7 ⁻	1919.6 7 ⁻	1920.3 9 ⁻	2018.1 13 ⁺
1601.34(6)	5 ⁺			<6								
1763.45(22)	1 ⁺			<35								
1919.64(8)	7 ⁻								12(2)			
1920.28(7)	9 ⁻					5(3)						
2018.10(4)	13 ⁺				3(1)							
2025.21(9)	5 ⁺				13(4)		30(1)					
2143.5(3)	7 ⁺ , 9 ⁺			x	x							
2148.58(6)	9 ⁻	<4				13(9)						
2178.23(15)	7 ⁺				<27							
2223.17(6)	9 ⁻	32(1)				13(6)					6(1)	
2248.15(7)	11 ⁻	2.9(3)										
2353.74(17)	5 ⁻			<17								
2370.14(11)	5 ⁻	22(11)							22(11)			
2386.52(18)	9 ⁻								100			
2462.13(15)	11 ⁻	52(3)			48(24)							
2483.16(6)	15 ⁺											2(1)
2500.46(15)	5 ⁻	35(4)						33(4)				
2552.29(12)	11 ⁻	14(1)							42(2)			
2553.83(13)	7 ⁺						100					
2569.71(9)	7 ⁻	≤9										
2584.59(19)									≤50			
2589.67(21)	13 ⁺				100							
2615.36(14)	11 ⁺						32(16)					
2621.18(14)	⟨9 ⁺ ⟩	55(27)										32(7)

(continued)

⁶⁹Ge
₃₂

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	1430.2 9 ⁻	1432.6 3 ⁺	1466.0 9 ⁺	1478.7 7 ⁻	1590.8 7 ⁺	1610.9 5 ⁻	1613.3 7 ⁻	1919.6 7 ⁻	1920.3 9 ⁻	2018.1 13 ⁺
2637.51(10)	9 ⁺		53(17)			35(1)						12(6)
2638.77(11)	9 ⁺				12(1)		52(22)					17(9)
2654.72(22)			[100]									
2730.06(9)	13 ⁻		88(2)								12(9)	
2755.07(5)	17 ⁺											<1
2814.81(9)	13 ⁻											20(2)
2834.09(8)	13 ⁻											10(7)
2856.24(18)	5 ⁻ , 7 ⁻		73(24)			27(12)						
2887.3(3)												100
2902.31(8)	15 ⁺											25(1)
3075.80(5)	11 ⁻		40(20)									
3075.84(19)	15 ⁻									11(1)		12(8)
3092.4(3)	11 ⁻										100	
3157.25(6)	17 ⁺											65(1)
3207.84(9)	15 ⁺											25(6)
3291.70(21)			100									
3343.28(15)	7 ⁻		57(3)									
3433.2(3)	3 ⁻ -7 ⁻							33(22)				
3541.1(3)	7 ⁻		100									
3636.82(21)												100
3759.7(3)												100
3940.02(21)	13 ⁺											100

Energy levels and branching ratios [00Bh05]. Part 4

⁶⁹Ge
₃₂

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		$E_f^*:$ $2J_f^\pi:$	2025.2 5 ⁺	2119.2 11 ⁺	2148.6 9 ⁻	2223.2 9 ⁻	2248.2 11 ⁻	2258.1 9 ⁻	2370.1 5 ⁻	2483.2 15 ⁺	2604	2637.5 9 ⁺
2552.29(12)	11 ⁻						<10					
2569.71(9)	7 ⁻					x						
2621.18(14)	⟨9 ⁺ ⟩		14(7)									
2638.77(11)	9 ⁺		6(1)									
2730.06(9)	13 ⁻						<3					
2755.07(5)	17 ⁺									<2		
2909.94(23)									100			
3075.80(5)	11 ⁻						x					<10
3144.31(11)	9 ⁻				69(5)		17(2)				x	
3157.25(6)	17 ⁺									25(10)		
3343.28(15)	7 ⁻				x			43(7)				
3361.26(25)				x								
3395.88(11)	15 ⁻						100					
3508.21(9)	15 ⁺									33(2)		

(continued)

⁶⁹₃₂Ge

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	2025.2 5 ⁺	2119.2 11 ⁺	2148.6 9 ⁻	2223.2 9 ⁻	2248.2 11 ⁻	2258.1 9 ⁻	2370.1 5 ⁻	2483.2 15 ⁺	2604	2637.5 9 ⁺
3559.99(16)							39(20)					61(20)
3605.06(11)	17 ⁻									18(3)		
3645.09(10)	11 ⁻						61(10)					
3666.76(8)	17 ⁻									37(3)		
3721.57(21)										100		
3813.69(13)	13 ⁻						24(3)					
3956.14(16)	13 ⁺									68(4)		
3963.84(9)										100		

Energy levels and branching ratios [00Bh05]. Part 5

⁶⁹₃₂Ge

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	2730.1 13 ⁻	2755.1 17 ⁺	2834.1 13 ⁻	2902.3 15 ⁺	3075.8 11 ⁻	3075.8 15 ⁻	3157.2 17 ⁺	3395.9 15 ⁻	3605.1 17 ⁻	3666.8 17 ⁻
3075.80(5)	11 ⁻		60(2)									
3075.84(19)	15 ⁻				10(1)							
3144.31(11)	9 ⁻		<9									
3157.25(6)	17 ⁺			10(7)								
3207.84(9)	15 ⁺			22(2)								
3508.21(9)	15 ⁺					x			47(2)			
3605.06(11)	17 ⁻		61(3)		6(4)		15(7)					
3645.09(10)	11 ⁻				26(13)		13(5)					
3666.76(8)	17 ⁻				33(14)		30(14)					
3749.11(5)	19 ⁻			58(2)			23(1)		18.5(12)			
3813.69(13)	13 ⁻		43(3)		33(3)		<17					
3925.9(3)	15 ⁺								100			
3956.14(16)	13 ⁺		<20					32(16)				
3990.5(4)			100									
4067.86(7)	19 ⁻			39(20)				8(4)	10(6)	10(6)		18(8)
4107.7(3)							100					
4267.10(8)	21 ⁻										33(1)	
4305.71(14)	21 ⁽⁺⁾			100								
4493.5(3)				100								
4837.06(23)				100								

Energy levels and branching ratios [00Bh05]. Part 6

⁶⁹₃₂Ge

E^*	$2J^\pi$	E_f^* :	3749.1	3963.8	4067.9	4267.1	4305.7	4566.4	4594.3	4837.1	5006.2	5593.0
[keV]		$2J_f^\pi$:	19 ⁻		19 ⁻	21 ⁻	21 ⁽⁺⁾		23 ⁻		⟨25 ⁻ ⟩	23 ⁻
4067.86(7)	19 ⁻		16(8)									
4267.10(8)	21 ⁻		67(3)	x								
4566.36(13)			100									
4594.26(8)	23 ⁻		32(2)		23(2)	42(2)	3(2)					
4714.75(11)			43(21)			43(21)		14(7)				
5006.2(3)	⟨25 ⁻ ⟩					100						
5089.8(3)			100									
5467									100			
5593.02(13)	23 ⁻					100						
5737.80(11)								50(27)	50(27)			
5802											x	
5834.76(12)	27 ⁻								100			
5841.7(5)									100			
5897.93(24)	⟨25 ⁺ ⟩						100					
6041.84(13)						38(25)				62(50)		
6086.83(14)									100			
6291.71(13)	⟨25 ⁺ ⟩						x		100			
6548.45(14)	⟨25 ⁺ ⟩						x		100			
6839.54(11)	25 ⁽⁻⁾											49(3)
7412.4(4)												100

Energy levels and branching ratios [00Bh05]. Part 7

⁶⁹₃₂Ge

E^*	$2J^\pi$	E_f^* :	5737.8	5834.8	5841.7	5897.9	6041.8	6086.8	6291.7	6548.4	6839.5	7147.5
[keV]		$2J_f^\pi$:		27 ⁻		⟨25 ⁺ ⟩			⟨25 ⁺ ⟩	⟨25 ⁺ ⟩	25 ⁽⁻⁾	29 ⁽⁺⁾
6504.2(8)					100							
6591.1(6)				100								
6839.54(11)	25 ⁽⁻⁾		14(4)				23(7)	9(4)	2(1)	3(2)		
7147.55(13)	29 ⁽⁺⁾			83(4)		3(2)			13(6)			
7405.5(4)						100						
7578.5(2)	29 ⁽⁻⁾										100	
7780.2(2)	31 ⁽⁻⁾			100								
7903.6(2)	33 ⁽⁺⁾											100

Energy levels and branching ratios [00Bh05]. Part 8

⁶⁹Ge
₃₂

E^* [keV]	$2J^\pi$	$E_f^*:$ $2J_f^\pi:$	Branching ratios in percentage		
			7578.5 29 ⁽⁻⁾	7780.2 31 ⁽⁻⁾	7903.6 33 ⁽⁺⁾
8708.8(3)	$\langle 33^- \rangle$		100		
9012.3(2)	$\langle 35^- \rangle$			100	
9182.3(2)	$\langle 37^+ \rangle$				100

Energy levels and branching ratios [93Bh01, 04Tu09].

⁷⁰Ge
₃₂

E^* [keV]	J^π	σ (¹² C, ¹⁰ Be) $\mu\text{b/sr}$	S'_α (d, ⁶ Li)	S_α (⁶ Li, d)	L	C^2S' (τ , d)	L (p, t)	σ (p, t) $\mu\text{b/sr}$	R (p, t)	ε (p, t)	βR (α , α')	I_s [eVb]	$\Gamma_{\gamma f}$ [meV]	Ref.
0.0	0 ⁺		0.49	3.03	1	2.0	0	6200	1.5	13.2				77Gu12
1039.25(6)	2 ⁺	72	0.20		1+3	1.0+1.0	2	1600			1.00			75Ar29
1215.41(6)	0 ⁺		0.13	0.14	1	0.87	0	440	0.12		0.08			80Ar14
1707.9(1)	2 ⁺				1+3	0.4+0.5	2	120			0.15			75Ar29
2153.5(2)	4 ⁺				1+3	0.8+0.7		90			0.10			75Ar29
2157.4(2)	2 ⁺							incl			0.15			87Sc31
2306.9(5)	0 ⁺				1	0.13	0	55	0.02					77Gu12
2451.5(1)	3 ⁺				3	2.27								75Ar29
2535.7(3)	2 ⁺				1+3	0.2+0.6	2	140	0.29					77Gu12
2561.4(1)	3 ⁻	173			4	1.31	3	460	0.91	6.9	1.02			77Gu12
2806.7(2)	4 ⁺				3	1.14	4	30	0.1		0.05			77Gu12
2887.8(8)	0 ⁺				1	0.22	0	30	0.01					77Gu12
2945.2(10)	2 ⁺				1+3	0.4+2.7	2	110	0.22		0.07			77Gu12
3046.8(2)	3 ⁺				3	11.7								75Ar29
3058.9(1)	4 ⁺	317					4	230	0.89		0.54			77Gu12
3107.0(8)	$\langle 0^+ \rangle$						$\langle 0 \rangle$	20	0.003					77Gu12
3180.4(10)	2 ⁺				1+3	0.8+1.6	2	290	0.6		0.14			77Gu12
3194.2(6)	4 ⁺						4	220	0.73		0.16			77Gu12
3240.4(4)	1 ⁺				1+3	1.2+1.0						3.3(6)	9(3)	95Ju01
3296.1(4)	3 ⁺ , 4 ⁺							10						77Gu12
3297.3(2)	6 ⁺													
3314.8(4)	1 ⁻				2	0.07	$\langle 1 \rangle$	40	0.012		0.05	11(3)	11(3)	95Ju01
3334.6(10)	0 ⁺ -3 ⁺				1	0.59	0	110	0.04					75Ar29
3345(2)														
3351(2)														
3371.9(5)	$\langle 3, 4 \rangle$													
3416.6(1)	5 ⁻						5	70	0.6					77Gu12
3423(2)	$\langle 2^+ \rangle$				1+3	0.4+0.5	$\langle 2 \rangle$	100	0.17					77Gu12
3428(2)	5 ⁻										0.41			87Sc31
3432(2)	3 ⁻										0.21			87Sc31
3456(2)	3 ⁺ -5 ⁺							10						77Gu12
3482.3(5)	1 ⁺ -3 ⁺				1+3	0.05+0.1		15						75Ar29
3489.4(3)	$\langle 3, 4 \rangle$	101												

(continued)

⁷⁰₃₂Ge

E^*	J^π	σ (¹² C, ¹⁰ Be)	S'_α	S_α	L	C^2S'	L	σ (p,t)	R	βR	I_s	$\Gamma_{\gamma f}$	Ref.
[keV]		$\mu\text{b/sr}$	(d, ⁶ Li)	(⁶ Li, d)		(τ , d)	(p, t)	$\mu\text{b/sr}$	(p, t)	(α, α')	[eVb]	[meV]	
3562.7(6)								140					
3568(3)	$\langle 2-4 \rangle^-$				4	0.21							75Ar29
3581.1(10)	4^+									0.30			87Sc31
3590.3(5)													
3631.2(10)	$\langle 2 \rangle^+$				1	0.49	$\langle 2 \rangle$	350	0.83				77Gu12
3637(10)	0^+									0.09			87Sc31
3667.1(2)	6^-												
3669.6(10)													
3676.7(5)	4^+									0.13			87Sc31
3683(3)	0^+						0	120	0.049				77Gu12
3687(3)	1^+-3^+				1+3	0.5+0.6							75Ar29
3708.5(9)													
3733(3)	1^+-3^+				1+3	0.05+0.03							75Ar29
3740(3)	0^+						0	20	0.01				77Gu12
3753.4(5)	$\langle 5, 6 \rangle^+$												
3776(2)	3^-									0.21			87Sc31
3782(2)	2^+				1+3	0.03+0.2	2	120	0.35				77Gu12
3850(3)													
3856(2)	$\langle 2 \rangle^-$				4+2	0.4+0.02							75Ar29
3870(2)	3^-							24		0.09			77Gu12
3890(3)	1^+-3^+				1+3	0.8+1.5							77Gu12
3895.1(8)	1^+						$\langle 1 \rangle$	33	0.008		11(3)	14(5)	95Ju01
3903.9(7)	1^+-3^+				1+3	0.3+0.3							75Ar29
3911(3)													
3928(3)	4^+						4	40	0.17				77Gu12
3955.4(2)	7^-	220								0.20			87Sc31
3964(3)	$\langle 2 \rangle^-$				4+2	0.7+0.04							75Ar29
3976(3)	2^+									0.11			87Sc31
3990(3)													
4003(2)													
4024(3)	4^+						4	120	0.49				77Gu12
4037(3)	$\langle 4^+ \rangle$									0.24			87Sc31
4054(3)													
4061(2)	1^+-3^+				1+3	0.3+0.15							75Ar29
4080(3)	1^+-3^+				1+3	0.2+0.3							75Ar29
4086(3)	4^+						4	59	0.21				77Gu12
4096.1(20)	3^-									0.22			87Sc31
4102.4(4)	$\langle 3, 4^+ \rangle$												
4119(3)													
4131(2)	2^-				4+2	1.0+0.02							75Ar29
4144.7(20)	1^-									0.03			87Sc31
4155(2)	1^+-3^+				1+3	0.3+0.2							75Ar29
4166(3)													
4180(3)	2^+						2	150	0.55				77Gu12
4204.0(5)	8^+												

(continued)

⁷⁰₃₂Ge

E^*	J^π	σ (¹² C, ¹⁰ Be)	S'_α	S_α	L	C^2S'	L	σ (p,t)	R	βR	I_s	$\Gamma_{\gamma f}$	Ref.
[keV]		$\mu\text{b/sr}$	(d, ⁶ Li)	(⁶ Li, d)		(τ , d)	(p, t)	$\mu\text{b/sr}$	(p, t)	(α , α')	[eVb]	[meV]	
4212(3)	$\langle 4 \rangle^+$												
4226(3)	2^+						2	40	0.13				77Gu12
4238(3)	1^+-3^+				1+3	0.1+0.27							75Ar29
4242(3)							4,5	50					77Gu12
4261(10)	2^+						2	20	0.061				74Ba67
4268(10)	5^-									0.34			87Sc31
4287(3)	3^+				1+3	0.2+0.26							75Ar29
4299.4(3)	7^+												
4304(10)	7^-									0.09			87Sc31
4330(3)	$\langle 2 \rangle^-$	591			4+2	1.4+0.07							75Ar29
4332	X^+						0	60	0.046	0.08			75Ar29
4345	X^+						2	180					77Gu12
4352(3)	$\langle 2 \rangle^-$				4+2	0.8+0.04							75Ar29
4357(10)	X^+						2	140	0.18				74Ba67
4356.6(7)	$1^{\langle - \rangle}$										41(7)	67(11)	95Ju01
4365(10)	$\langle 3^- \rangle$									0.07			87Sc31
4378(10)							[2]		0.14				74Ba67
4391(3)	1^+-3^+				1+3	0.2+0.4							75Ar29
4409(10)	4^+									0.09			87Sc31
4419(3)	2^--4^-				4+2	0.1+0.1							75Ar29
4432.0(5)	$\langle 8 \rangle^+$												
4447.3(8)	1^-										36(7)	111(20)	95Ju01
4448(2)	2^+						2	70	0.27				77Gu12
4473(2)	4^+				1+3	0.1+0.5	4	60	0.26	0.10			77Gu12
4520(3)	2^--4^-				4+2	0.5+0.05							75Ar29
4520.7(9)	1^-										38(5)		95Ju01
4534(10)	$\langle 4^+ \rangle$									0.13			87Sc31
4539(3)	0^+						0	56	0.035				77Gu12
4546(10)													
4549.7(5)	$\langle 8 \rangle$												
4555(3)													
4574(3)													
4578.6(8)	$\langle 3, 4 \rangle$												
4606(10)													
4613(3)	1^+-3^+				1+3	0.1+0.5							75Ar29
4629(3)	$\langle 4^+ \rangle$							40		0.12			77Gu12
4642(3)	$\langle 2 \rangle^-$				4+2	0.4+0.04							75Ar29
4657(10)													
4671.2(10)	$\langle 3, 4 \rangle$												
4687(2)	$\langle 2 \rangle^-$				4+2	2.1+0.1							75Ar29
4707(10)													
4716(10)							$\langle 2 \rangle$	30	0.12				74Ba67
4727(10)													
4736(3)					4=2	$\langle 1.14 \rangle$							75Ar29
4768(3)	$\langle 2 \rangle^-$				4+2	0.6+0.06							75Ar29

(continued)

⁷⁰₃₂Ge

E^*	J^π	σ (¹² C, ¹⁰ Be)	S'_α	S_α	L	C^2S'	L	σ (p,t)	R	βR	I_s	$\Gamma_{\gamma f}$	Ref.
[keV]		$\mu\text{b/sr}$	(d, ⁶ Li)	(⁶ Li, d)		(τ , d)	(p, t)	$\mu\text{b/sr}$	(p, t)	(α, α')	[eVb]	[meV]	
4775(10)	$\langle 4^+ \rangle$									0.08			87Sc31
4790.4(19)	1										14(8)	28(16)	95Ju01
4810(10)	3^-									0.10			87Sc31
4847(3)	$\langle 2^- \rangle$				4+2	0.7+0.08							75Ar29
4852.2(5)	$\langle 8^- \rangle$												
4877(3)	2^-				4+2	1.0+0.03*							75Ar29
4886.4(13)	1										19(5)	40(10)	95Ju01
4905(3)	3^-				4=2	$\langle 1.01 \rangle$				0.13			75Ar29
4915(10)													
4935(3)	1^-						1	60	0.038				77Gu12
4940(10)	3^-									0.17			87Sc31
4943(3)	$\langle 2^- \rangle$				4+2	0.5+0.05							75Ar29
4979(3)	$\langle 2^- \rangle$				4+2	0.2+0.03							75Ar29
4985.3(11)													
5008(3)	2^-				4=0	1.4+0.04*				0.11			75Ar29
5024(3)	2^+						2	40	0.18				77Gu12
5040(10)	$\langle 3^- \rangle$									0.16			87Sc31
5048.7(11)	2^-				4=0	1.8+0.02*							75Ar29
5050(3)	0^+						0	13	0.008				77Gu12
5078(3)	1^+-3^+				1+3	0.1+0.02				0.16			75Ar29
5102(3)	1^+-3^+				1+3	0.1+0.02							75Ar29
5113(10)	$\langle 3^- \rangle$									0.14			87Sc31
5129.4(7)	1^-										39(11)	136(38)	95Ju01
5145(3)	$\langle 3^- \rangle$				4=0	$\langle 0.79 \rangle$				0.12			75Ar29
5184(3)	0^+						0	17	0.013				77Gu12
5195(10)	$\langle 4^+ \rangle$									0.07			87Sc31
5227(10)	$\langle 3^- \rangle$									0.15			87Sc31
5243.2(11)													
5263.2(8)	$1^{\langle - \rangle}$										47(9)	112(21)	95Ju01
5290(3)	0^+						0	34	0.033				77Gu12
5299.5(5)	$\langle 6-8 \rangle$												
5305.0(22)													
5338(3)	0^+						0	20	0.014				77Gu12
5372.6(5)													
5403(3)	0^+						0	20	0.014				77Gu12
5410(3)													
5441(3)	$\langle 2^+ \rangle$						$\langle 2 \rangle$	30	0.16				77Gu12
5465.1(10)	1^-										51(9)	133(22)	95Ju01
5467(3)	0^+						0	30	0.018				77Gu12
5472(1)													
5512.3(10)	$1^{\langle - \rangle}$										43(7)	113(18)	95Ju01
5540.3(6)	$\langle 10^- \rangle$												
5876.6(7)	$1^{\langle - \rangle}$										32(10)	96(30)	95Ju01
5989.4(7)	$1^{\langle + \rangle}$										48(10)	149(31)	95Ju01
6296.7(14)	1										43(14)	277(87)	95Ju01

(continued)

⁷⁰₃₂Ge

E^*	J^π	σ (¹² C, ¹⁰ Be)	S'_α	S_α	L	C^2S'	σ (p,t)	R	ε	βR	I_s	$\Gamma_{\gamma f}$	Ref.
[keV]		$\mu\text{b/sr}$	(d, ⁶ Li)	(⁶ Li, d)	(τ , d)		$\mu\text{b/sr}$	(p, t)	(p, t)	(α , α')	[eVb]	[meV]	
6362.5(8)	1										38(8)	133(28)	95Ju01
6587.4(12)	1 ⁽⁺⁾										36(7)	333(62)	95Ju01
6636.3(15)	1										44(7)	168(25)	95Ju01
6702.2(13)	1 ⁽⁻⁾										74(13)	289(49)	95Ju01
7305.9(8)	1 ⁽⁺⁾										54(13)	249(60)	95Ju01
7425.6(16)	1 ⁽⁻⁾										66(13)	316(60)	95Ju01
7753.0(10)	1 ⁽⁻⁾										59(13)	430(92)	95Ju01
8283.2(15)	1 ⁽⁺⁾										52(15)	307(85)	95Ju01
8877.9(14)	1										48(12)	332(78)	95Ju01
		90Bo27		80Ar14	75Ar29	77Gu12	77Gu12	74Ba67	87Sc31	95Ju01	95Ju01		Ref.
			82Va08		04Tu09								Ref.

Additional data on this isotope can be found in [02To0A, 02Li41, 00Mu23, 95Ju01, 89Ro12, 89Ca02, 87Sc31, 78Ar17].

Abundance: 20.37(18) %.

* Spectroscopic factors calculated assuming $g_{7/2}$ transfer [75Ar29, 04Tu09].

σ (p,t) (exp at peak)/ $\sigma(DWBA)$ with estimated uncertainty 20% is given.

Two-proton transfer reaction (¹²C, ¹⁰Be) on ⁶⁸Zn was measured at 10° [90Bo27].

Parameter of the (d, ⁶Li) reaction $S'_\alpha = (2J+1)\sigma_{exp}/\sigma_{DWBA}$ was measured in the angular range from 0° to 30° at the energy 45 MeV [82Va08].

Energy levels and branching ratios [93Bh01, 04Tu09]. Part 2

⁷⁰₃₂Ge

E^*	J^π	σ (p,t)	$T_{1/2}$ or	Ref.	Branching ratios in percentage								
[keV]		$\mu\text{b/sr}$	Γ_{cm}		E_f^* : J_f^π :	0.0 0 ⁺	1039 2 ⁺	1215 0 ⁺	1708 2 ⁺	2153 4 ⁺	2157 2 ⁺	2451 3 ⁺	2536 2 ⁺
0.0	0 ⁺	760	Stable	77Gu12									
1039.25(6)	2 ⁺	280	1.30(2) ps	75Ar29	100								
1215.41(6)	0 ⁺	38	3.7(2) ns	80Ar14	x	100							
1707.9(1)	2 ⁺	10	1.1(+10-4) ps	75Ar29	45(1)	53(1)	2.4(2)						
2153.5(2)	4 ⁺	<5	0.8(2) ps	75Ar29		99(1)		0.8(2)					
2157.4(2)	2 ⁺			87Sc31	8(1)	63(6)	28(3)	2.1(5)					
2306.9(5)	0 ⁺		≤40 ps	77Gu12	x	55(4)	x	45(4)					
2451.5(1)	3 ⁺		1.7(+10-3) ps	75Ar29		29(3)		70(1)	1.3(3)	1			
2535.7(3)	2 ⁺		0.6(2) ps	77Gu12		75(8)	7.2(8)	17(4)					
2561.4(1)	3 ⁻	50	0.4(1) ps	77Gu12		100							
2806.7(2)	4 ⁺		0.6(2) ps	77Gu12					88(8)	12(3)			
2887.8(8)	0 ⁺			77Gu12					50(8)		50(5)		
2945.2(10)	2 ⁺			77Gu12					100				
3046.8(2)	3 ⁺			75Ar29		9(1)		26(3)	6	9(1)		49(5)	
3058.9(1)	4 ⁺		0.20(+10-3) ps	77Gu12		42(4)		1.5(3)	30(3)	3		10(1)	
3107.0(8)	⟨0 ⁺ ⟩			77Gu12	x			x					
3180.4(10)	2 ⁺		0.015(6) ps	77Gu12		100							

(continued)

⁷⁰₃₂Ge

E^*	J^π	σ (p,t)	$T_{1/2}$ or	Ref.	Branching ratios in percentage								
[keV]		$\mu\text{b/sr}$	Γ_{cm}		E_f^* : J_f^π :	0.0 0 ⁺	1039 2 ⁺	1215 0 ⁺	1708 2 ⁺	2153 4 ⁺	2157 2 ⁺	2451 3 ⁺	2536 2 ⁺
3194.2(6)	4 ⁺			77Gu12									
3240.4(4)	1 ⁺			95Ju01									
3296.1(4)	3 ⁺ ,4 ⁺			77Gu12			16(8)		54(11)				30(15)
3297.3(2)	6 ⁺		0.5(1) ps							100			
3314.8(4)	1 ⁻			95Ju01			100						
3334.6(10)	0 ⁺ -3 ⁺			75Ar29			100						
3345(2)													
3351(2)													
3371.9(5)	$\langle 3,4 \rangle$		0.3(2) ps				31(22)			69(12)			
3416.6(1)	5 ⁻		13.7(10) ps	77Gu12						42(5)			
3423(2)	$\langle 2^+ \rangle$			77Gu12									
3428(2)	5 ⁻			87Sc31									
3432(2)	3 ⁻			87Sc31									
3456(2)	3 ⁺ -5 ⁺			77Gu12									
3482.3(5)	1 ⁺ -3 ⁺			75Ar29									
3489.4(3)	$\langle 3,4 \rangle$						[6]		[65]	[10]	[10]		[8]
3562.7(6)													
3568(3)	$\langle 2-4 \rangle^-$			75Ar29									
3581.1(10)	4 ⁺		0.6(2) ps	87Sc31						100			
3590.3(5)													
3631.2(10)	$\langle 2 \rangle^+$		0.5(1) ps	77Gu12			100						
3637(10)	0 ⁺			87Sc31									
3667.1(2)	6 ⁻		35(3) ps										
3669.6(10)			1(1) ps									100	
3676.7(5)	4 ⁺			87Sc31			6(1)			94(9)			
3683(3)	0 ⁺			77Gu12									
3687(3)	1 ⁺ -3 ⁺			75Ar29									
3708.5(9)													
3733(3)	1 ⁺ -3 ⁺			75Ar29									
3740(3)	0 ⁺			77Gu12									
3753.4(5)	$\langle 5,6 \rangle^+$		1.6(5) ps										
3776(2)	3 ⁻			87Sc31									
3782(2)	2 ⁺			77Gu12									
3850(3)													
3856(2)	$\langle 2 \rangle^-$			75Ar29									
3870(2)	3 ⁻			77Gu12									
3890(3)	1 ⁺ -3 ⁺			77Gu12									
3895.1(8)	1 ⁺			95Ju01									
3903.9(7)	1 ⁺ -3 ⁺			75Ar29									
3911(3)													
3928(3)	4 ⁺			77Gu12									
3955.4(2)	7 ⁻		17.0(10) ps	87Sc31									
3964(3)	$\langle 2 \rangle^-$			75Ar29									
3976(3)	2 ⁺			87Sc31									
3990(3)													

(continued)

⁷⁰₃₂Ge

E^*	J^π	σ (p,t)	$T_{1/2}$ or	Ref.	Branching ratios in percentage								
[keV]		$\mu\text{b/sr}$	Γ_{cm}		E^*_f : J^π_f :	0.0 0 ⁺	1039 2 ⁺	1215 0 ⁺	1708 2 ⁺	2153 4 ⁺	2157 2 ⁺	2451 3 ⁺	2536 2 ⁺
4003(2)													
4024(3)	4 ⁺			77Gu12									
4037(3)	$\langle 4^+ \rangle$			87Sc31									
4054(3)													
4061(2)	1 ⁺ –3 ⁺			75Ar29									
4080(3)	1 ⁺ –3 ⁺			75Ar29									
4086(3)	4 ⁺			77Gu12									
4096.1(20)	3 [–]			87Sc31									
4102.4(4)	$\langle 3, 4^+ \rangle$									67(13)	33(33)		
4119(3)													
4131(2)	2 [–]			75Ar29									
4144.7(20)	1 [–]			87Sc31									
4155(2)	1 ⁺ –3 ⁺			75Ar29									
4166(3)													
4180(3)	2 ⁺			77Gu12									
4204.0(5)	8 ⁺		8(2) ps										
4212(3)	$\langle 4 \rangle^+$												
4226(3)	2 ⁺			77Gu12									
4238(3)	1 ⁺ –3 ⁺			75Ar29									
4242(3)				77Gu12									
4261(10)	2 ⁺			74Ba67									
4268(10)	5 [–]			87Sc31									
4287(3)	3 ⁺			75Ar29									
4299.4(3)	7 ⁺		3(1) ps										
4304(10)	7 [–]			87Sc31									
4330(3)	$\langle 2 \rangle^-$			75Ar29									
4332	X ⁺			75Ar29									
4345	X ⁺			77Gu12									
4352(3)	$\langle 2 \rangle^-$			75Ar29									
4357(10)	X ⁺			74Ba67									
4356.6(7)	1 ^(–)			95Ju01									
4365(10)	$\langle 3^- \rangle$			87Sc31									
4378(10)				74Ba67									
4391(3)	1 ⁺ –3 ⁺			75Ar29									
4409(10)	4 ⁺			87Sc31									
4419(3)	2 [–] –4 [–]			75Ar29									
4432.0(5)	$\langle 8 \rangle^+$		0.4(2) ps										
4447.3(8)	1 [–]			95Ju01									
4448(2)	2 ⁺			77Gu12									
4473(2)	4 ⁺			77Gu12									
4520(3)	2 [–] –4 [–]			75Ar29									
4520.7(9)	1 [–]			95Ju01									
4534(10)	$\langle 4^+ \rangle$			87Sc31									
4539(3)	0 ⁺			77Gu12									
4546(10)													

(continued)

⁷⁰₃₂Ge

E^* [keV]	J^π	σ (p,t) $\mu\text{b/sr}$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage								
					E^*_f : J^π_f :	0.0 0 ⁺	1039 2 ⁺	1215 0 ⁺	1708 2 ⁺	2153 4 ⁺	2157 2 ⁺	2451 3 ⁺	2536 2 ⁺
4549.7(5)	⟨8⟩		104(+70-35) ps										
4555(3)													
4574(3)													
4578.6(8)	⟨3,4⟩									x	x		
4606(10)													
4613(3)	1 ⁺ –3 ⁺			75Ar29									
4629(3)	⟨4 ⁺ ⟩			77Gu12									
4642(3)	⟨2 [−] ⟩			75Ar29									
4657(10)													
4671.2(10)	⟨3,4⟩							29(29)	29(29)			42(21)	
4687(2)	⟨2 [−] ⟩			75Ar29									
4707(10)													
4716(10)				74Ba67									
4727(10)													
4736(3)				75Ar29									
4768(3)	⟨2 [−] ⟩			75Ar29									
4775(10)	⟨4 ⁺ ⟩			87Sc31									
4790.4(19)	1			95Ju01									
4810(10)	3 [−]			87Sc31									
4847(3)	⟨2 [−] ⟩			75Ar29									
4852.2(5)	⟨8 [−] ⟩		>3 ps										
4877(3)	2 [−]			75Ar29									
4886.4(13)	1			95Ju01									
4905(3)	3 [−]			75Ar29									
4915(10)													
4935(3)	1 [−]			77Gu12									
4940(10)	3 [−]			87Sc31									
4943(3)	⟨2 [−] ⟩			75Ar29									
4979(3)	⟨2 [−] ⟩			75Ar29									
4985.3(11)													
5008(3)	2 [−]			75Ar29									
5024(3)	2 ⁺			77Gu12									
5040(10)	⟨3 [−] ⟩			87Sc31									
5048.7(11)	2 [−]			75Ar29									
5050(3)	0 ⁺			77Gu12									
5078(3)	1 ⁺ –3 ⁺			75Ar29									
5102(3)	1 ⁺ –3 ⁺			75Ar29									
5113(10)	⟨3 [−] ⟩			87Sc31									
5129.4(7)	1 [−]			95Ju01									
5145(3)	⟨3 [−] ⟩			75Ar29									
5184(3)	0 ⁺			77Gu12									
5195(10)	⟨4 ⁺ ⟩			87Sc31									
5227(10)	⟨3 [−] ⟩			87Sc31									
5243.2(11)													
5263.2(8)	1 ^{⟨−} ⟩			95Ju01									

(continued)

⁷⁰₃₂Ge

E^* [keV]	J^π	σ (p,t) $\mu\text{b/sr}$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage								
					E_f^* : J_f^π :	0.0 0 ⁺	1039 2 ⁺	1215 0 ⁺	1708 2 ⁺	2153 4 ⁺	2157 2 ⁺	2451 3 ⁺	2536 2 ⁺
5290(3)	0 ⁺			77Gu12									
5299.5(5)	⟨6-8⟩												
5305.0(22)								x				x	
5338(3)	0 ⁺			77Gu12									
5372.6(5)							2(2)						
5403(3)	0 ⁺			77Gu12									
5410(3)													
5441(3)	⟨2 ⁺ ⟩			77Gu12									
5465.1(10)	1 ⁻			95Ju01									
5467(3)	0 ⁺			77Gu12									
5472(1)							x						
5512.3(10)	1 ^{⟨-⟩}			95Ju01									
5540.3(6)	⟨10 ⁻ ⟩		5(2) ns										
5876.6(7)	1 ^{⟨-⟩}			95Ju01									
5989.4(7)	1 ^{⟨+⟩}			95Ju01									
6296.7(14)	1			95Ju01									
6362.5(8)	1			95Ju01									
6587.4(12)	1 ^{⟨+⟩}			95Ju01									
6636.3(15)	1			95Ju01									
6702.2(13)	1 ^{⟨-⟩}			95Ju01									
7305.9(8)	1 ^{⟨+⟩}			95Ju01									
7425.6(16)	1 ^{⟨-⟩}			95Ju01									
7753.0(10)	1 ^{⟨-⟩}			95Ju01									
8283.2(15)	1 ^{⟨+⟩}			95Ju01									
8877.9(14)	1			95Ju01									
				Ref.									
		74Ba67		Ref.									

Energy levels and branching ratios [93Bh01, 04Tu09]. Part 3

⁷⁰₃₂Ge

E^* [keV]	J^π	Branching ratios in percentage								
		E_f^* : J_f^π :	2561.4 3 ⁻	2806.7 4 ⁺	3046.8 3 ⁺	3058.9 4 ⁺	3296.1 3 ⁺ ,4 ⁺	3297.3 6 ⁺	3416.6 5 ⁻	3489.4 ⟨3,4⟩
3046.8(2)	3 ⁺			0.6(1)						
3058.9(1)	4 ⁺		6(2)	7(1)						
3416.6(1)	5 ⁻		38(4)			21(4)				
3667.1(2)	6 ⁻								100	
3753.4(5)	⟨5,6⟩ ⁺			100						
3955.4(2)	7 ⁻							16(3)		
4204.0(5)	8 ⁺							100		
4299.4(3)	7 ⁺							58(12)		
4432.0(5)	⟨8⟩ ⁺							100		

(continued)

⁷⁰₃₂Ge

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	2561.4 3 ⁻	2806.7 4 ⁺	3046.8 3 ⁺	3058.9 4 ⁺	3296.1 3 ⁺ ,4 ⁺	3297.3 6 ⁺	3416.6 5 ⁻	3489.4 ⟨3,4⟩
4549.7(5)	⟨8⟩						x			
5372.6(5)					18(9)					80(16)
5472(1)					x					

Energy levels and branching ratios [93Bh01, 04Tu09]. Part 4

⁷⁰₃₂Ge

E^*	J^π	Branching ratios in percentage						
[keV]		E_f^* : J_f^π :	3667.1 6 ⁻	3955.4 7 ⁻	4204.0 8 ⁺	4299.4 7 ⁺	4432.0 ⟨8⟩ ⁺	
3955.4(2)	7 ⁻		84(8)					
4299.4(3)	7 ⁺			42(9)				
4549.7(5)	⟨8⟩					x		
4852.2(5)	⟨8 ⁻ ⟩			100				
4985.3(11)				100				
5048.7(11)	2 ⁻		100					
5243.2(11)					100			
5299.5(5)	⟨6-8⟩			100				
5540.3(6)	⟨10 ⁻ ⟩						100	

Energy levels and branching ratios [93Bh02].

⁷¹₃₂Ge

E^*	$2J^\pi$	L	S'	S'	σ (d,p)	L	C^2S	C^2S	σ (p,d)	R	σ (p,t)	ε	$T_{1/2}$ or	Ref.
[keV]			(d,p)	(d,p)	$\mu\text{b/sr}$		(p,d)	(p,d)	$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
0.0	1 ⁻	1	0.62	0.55	940	1	0.86	1.04	3050	3.2			11.43(3) d	77Bi08
174.949(4)	5 ⁻	3	1.49	0.4	70	3	3.72	3.64	1200				79(2) ns	77Bi08
198.37(1)	9 ⁺	4	4.15	7.3	610	4	1.97	1.93	incl		550	11.1	20.4(2) ms	77Bi08
499.906(5)	3 ⁻	1	0.36	0.27	600	1	1.61	2.32	5000	8.3				77Bi08
525.115(6)	5 ⁺	2	0.52	0.62	750	2	0.18							77Bi08
589.770(9)	7 ⁺				14									68Go02
708.198(5)	3 ⁻	1	≤0.01	0.054	130	1	0.14	0.17	450	3.5				77Bi08
747.253(5)	5 ⁻	3	0.12	0.021	25	3	0.38	0.31	55					77Bi08
808.25(1)	1 ^{⟨-⟩}				10			0.03	50					68Go02
817(3)					22				incl					68Go02
831.295(8)	3 ⁻				incl	1	0.01							75ShYV
886.94(10)	⟨3,5 ⁻ ⟩			0.014	35									68Go02
1026.56(1)	5 ⁻				59	3	0.16	0.03	50					75ShYV
1038.2(1)	9 ⁺										60			74Ba67
1095.51(1)	3 ⁻	1	0.14	0.10	280	1	0.29	0.37	720	2.6				77Bi08

(continued)

⁷¹₃₂Ge

E^*	$2J^\pi$	L	S'	S'	σ (d,p)	L	C^2S	C^2S	σ (p,d)	R	σ (p,t)	ε	$T_{1/2}$ or	Ref.
[keV]			(d,p)	(d,p)	$\mu\text{b/sr}$		(p,d)	(p,d)	$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
1096.1(2)	7													
1139.44(1)	3				28									68Go02
1154(3)														
1171(3)	5 ⁺	2	0.78	0.03	37				150	4.0				76Yo04
1172.4(3)	13 ⁺												0.9(2) ps	
1192.3(1)	11 ⁺												0.9(2) ps	
1205.14(1)	5 ⁺	2	0.32	0.04	46	3	0.19							77Bi08
1212.48(1)	5 ⁽⁻⁾													
1237(5)														
1288.66(15)	1 ⁻	1	0.05		59	1	0.12	0.18	360	6.1				77Bi08
1298.737(15)	3 ⁽⁻⁾													
1349.01(18)	1 ⁺	0	0.11	0.09	630	0	0.01	0.03	50					77Bi08
1378.72(5)	$\langle 7^-, 5^+ \rangle$	$\langle 3, 2 \rangle$	0.07	0.02	26									77Bi08
1406.64(1)	5 ⁻ , 7 ⁻				<7	3	0.14	0.26	50					75ShYV
1415.9(3)	1 ⁻ , 3, 5 ⁻				incl									
1422.00(10)	9 ⁻												1.0(2) ps	
1449.8(3)					28									68Go02
1454.2(10)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.02		incl									77Bi08
1474(3)	$\langle 5 \rangle^+$	2	0.11	0.55	140									77Bi08
1477.03(22)	11 ⁺				incl								0.54(8) ps	
1485(3)					incl									
1506.39(1)	5 ⁻ , 7 ⁻			0.06	77	3	0.40	0.53	90					75ShYV
1542.5(2)	$\langle 1^+, 3 \rangle$													
1558.74(1)	5 ⁺	2	0.24	0.21	280	3	0.07							77Bi08
1566.1(6)														
1598.53(2)	3 ⁻				40	1	0.04	0.09	160	4.0				75ShYV
1629.19(1)	$\langle 3^+, 5^- \rangle$													
1697.6(3)	9 ⁺	4	0.93	0.63	160									77Bi08
1743.42(2)	1 ⁻ , 3 ⁻					1	0.04	0.09	110					75ShYV
1780.765(18)	5 ⁻ , 7 ⁻			0.013	41	3	0.23	0.42	90					75ShYV
1792.098(9)	$\langle 3^+, 5^- \rangle$													
1801.13(7)	$\langle 5^+, 7 \rangle$													
1814(3)														
1836.4														
1841(3)														
1868(5)					10									68Go02
1891(3)														
1909(5)														
1937.45(4)	$\langle 3^+, 5^- \rangle$				≈ 20									68Go02
1940.53(11)	$\langle 9 \rangle^+$	4	0.26		incl									77Bi08
1949.2(4)														
1959.7(4)	11, 13													
1959.71(15)	1 ⁺	0	0.04	0.039	300									77Bi08
1965.06(7)	3 ⁻					1	0.11	0.18	250					75ShYV
1979(3)														

(continued)

⁷¹₃₂Ge

E^*	$2J^\pi$	L	S'	S'	σ (d,p)	L	C^2S	C^2S	σ (p,d)	R	σ (p,t)	ε	$T_{1/2}$ or	Ref.
[keV]			(d,p)	(d,p)	$\mu\text{b/sr}$		(p,d)	(p,d)	$\mu\text{b/sr}$	rel.	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
2031.9(11)	$\langle 5 \rangle^+$	2	0.03			[1]	0.02							77Bi08
2043(2)	$1^-, 3^-$	1	0.06	0.097	320									77Bi08
2071(5)														
2082(5)														
2094(3)														
2139(5)	$\langle 5^-, 7^- \rangle$	$\langle 3 \rangle$	$\langle 0.12 \rangle$	0.12	32									68Go02
2147.3(11)	$1, 3, 5^+$													
2180(5)		$\langle 0, 3 \rangle$			20									68Go02
2210(5)														
2225.5(11)	1^+	0	0.30	0.25	2000	0	0.02							77Bi08
2240(3)														
2259.5(11)	$1, 3, 5^+$													
2278(3)	$\langle 5^+ \rangle$	2	0.26	0.27		[1]	0.03							77Bi08
2297(5)														
2298.7(5)	$17^{\langle + \rangle}$													
2314.18(11)	$15^{\langle + \rangle}$													
2330(5)					≈ 50									68Go02
2346(2)		2	≤ 0.02		170	1	0.10	0.18	190					77Bi08
2348.8(4)	13^-													
2352.9(11)	$1, 3, 5^+$													
2363(3)	1^+	0	≤ 0.03											77Bi08
2386(3)	$5^-, 7^-$					3	0.14							75ShYV
2428.3(11)	$1, 3, 5^+$			0.02	160									68Go02
2435.8(11)	$1, 3, 5^+$				incl									
2455(3)														
2465.2(11)	$1, 3, 5^+$													
2479(4)														
2486(2)	1^+	0	0.03	0.044	360	0	0.01							77Bi08
2516.6(11)	$1, 3, 5^+$													
2523(3)	5^+	2	0.17	0.21	370									77Bi08
2535.9(11)	$1, 3, 5^+$													
2543(3)					48									68Go02
2572(5)					incl									
2590(3)					41									68Go02
2616(3)					incl									
2644(3)	$\langle 5 \rangle^+$	2	0.11	0.18	320									77Bi08
2673(3)	$1^-, 3^-$				90	1	0.03							75ShYV
2696(3)														
2709(4)	$7^+, 9^+$					4	0.09							75ShYV
2725(5)														
2742(5)	$\langle 3^- \rangle$	$\langle 1 \rangle$	0.01	0.002	90									77Bi08
2756(3)	$\langle 5 \rangle^+$	2	0.06		320									77Bi08
2775(2)		0	0.02			1	0.02							77Bi08
2789(3)														
2802(5)														

(continued)

⁷¹Ge
³²

E^*	$2J^\pi$	L	S'	S'	σ (d,p)	L	C^2S	C^2S	σ (p,d)	R	σ (p,t)	ε	$T_{1/2}$ or	Ref.
[keV]			(d,p)	(d,p)	$\mu\text{b/sr}$		(p,d)	(p,d)	$\mu\text{b/sr}$	<i>rel.</i>	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
2830(3)					210									68Go02
2857(3)	$\langle 5 \rangle^+$	2	0.01											77Bi08
2865(4)	1^+				170	0	0.03							75ShYV
2881(3)	3^+	2	0.08		incl									77Bi08
2893(3)	$1^-, 3^-$	$\langle 1 \rangle$	0.17			1	0.02							77Bi08
2912(2)	$3^+, 5^+$				70	2	0.02							75ShYV
2922(5)					incl									
2940(3)														
2950(4)														
2960(3)	1^+	0	0.03	0.03	250									77Bi08
3003(3)	5^+	2	0.05		160									77Bi08
3035(3)	5^+	2	0.16		410									77Bi08
3065(3)	$\langle 5 \rangle^+$	2	0.03		380									77Bi08
3087(3)	1^+	0	≤ 0.03		incl									77Bi08
3101(3)														
3114(3)														
3129(3)														
3154(3)														
3161(5)														
3183(5)	1^+	0	0.06	0.07	620									77Bi08
3195(5)														
3205(5)	$\langle 5 \rangle^+$	2	0.07											77Bi08
3217(5)														
3232(3)	1^+	0	0.01		260									77Bi08
3268(5)														
3286(3)	$1^-, 3^-$	$\langle 1 \rangle$	≤ 0.03	0.09	180	1	0.07							77Bi08
3293(5)														
3311(5)	$\langle 1^-, 3^- \rangle$	$\langle 1 \rangle$	0.01											77Bi08
3334(3)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.07	0.07	140									68Go02
3365(4)					360									68Go02
3375(3)						1	0.02							75ShYV
3380(5)	$\langle 5^-, 1^+ \rangle$	$\langle 3, 0 \rangle$	0.20											77Bi08
3404(5)														
3422(5)	$\langle 5 \rangle^+$	2	0.04		190									77Bi08
3444(5)					incl									
3459(5)														
3473(5)					240									68Go02
3483(3)	$\langle 3 \rangle^+$	2	0.05											77Bi08
3496(5)														
3514(5)	$1^-, 3^-$				540	1	0.01							75ShYV
3533(5)					incl									
3557(3)	$\langle 5 \rangle^+$	2	0.02	0.16	350									77Bi08
3570(3)	$1^-, 3^-$	1	0.08		410									77Bi08
3597(3)	3^-	1	0.05		incl									77Bi08
3615(5)		[0]		0.043	420									68Go02

(continued)

⁷¹₃₂Ge

E^*	$2J^\pi$	L	S'	S'	σ (d,p)	L	C^2S	C^2S	σ (p,d)	R	σ (p,t)	ε	$T_{1/2}$ or	Ref.
[keV]			(d,p)	(d,p)	$\mu\text{b/sr}$		(p,d)	(p,d)	$\mu\text{b/sr}$	rel.	$\mu\text{b/sr}$	(p,t)	Γ_{cm}	
3633(3)														
3647(5)														
3661(3)					140									68Go02
3681(3)		$\langle 2,1 \rangle$			incl									
3721(3)	1^+	0	0.06	0.07	690									77Bi08
3744(3)														
3767(3)		$\langle 2 \rangle$	0.05		350	3	0.11							77Bi08
3778(5)														
3792(4)	$1^-, 3^-$					1	0.12							75ShYV
3824(5)														
3843(3)														
3855(3)														
3866(5)														
3884(5)														
3899(3)		2	0.07		220	1	0.02							77Bi08
3910(3)	$\langle 5^+ \rangle$	$\langle 2 \rangle$	0.07		incl									77Bi08
3924(3)														
3932(6)	$1^-, 3^-$					1	0.02							75ShYV
3944(3)		$\langle 1,2 \rangle$												
3960(3)	1^+	0	0.02	0.02	210									68Go02
3980(5)														
3996(5)					220									68Go02
4062(7)					410									68Go02
4080(10)					440									68Go02
4090(10)					410									68Go02
4140(10)					320									68Go02
4227(5)					460									68Go02
4310(10)					390									68Go02
4388(7)														
4410(10)	$\langle 1^+ \rangle$	$\langle 0 \rangle$		0.13	1400									68Go02
4520(10)					510									68Go02
				68Go02	68Go02			73Fo01		73Fo01	74Ba67			Ref.
			77Bi08		73Fo01	75ShYV			73Fo01					Ref.

Additional data on this isotope can be found in [93Fe03, 91Is01, 90Me01, 76Yo04, 73BaWI].

Ratios of neutron transfer and pickup reactions $R=\sigma$ (p,d)/ σ (d,p) were considered in [73Fo01].

Parameters ε – the enhancement factor of two-neutron pickup reaction (p,t) – are from [74Ba67].

Energy levels and branching ratios [93Bh02]. Part 2

⁷¹₃₂Ge

E^* [keV]	$2J^\pi$	Branching ratios in percentage										
		E_f^* : $2J_f^\pi$:	0.0 1 ⁻	175 5 ⁻	198 9 ⁺	499.9 3 ⁻	525 5 ⁺	590 7 ⁺	708 3 ⁻	747 5 ⁻	808.2 1 ⁽⁻⁾	831.3 3 ⁻
174.949(4)	5 ⁻		100									
198.37(1)	9 ⁺			100								
499.906(5)	3 ⁻		99.5	0.5(1)								
525.115(6)	5 ⁺			11.0(1)	89(1)							
589.770(9)	7 ⁺			0.5(1)	99.5		≤0.7					
708.198(5)	3 ⁻		93(2)	6.5(5)								
747.253(5)	5 ⁻		26(1)	42(1)		31						
808.25(1)	1 ⁽⁻⁾		33(3)	54(6)		13(3)						
831.295(8)	3 ⁻		75(1)			1.4(7)	22(3)	1.9(2)				
886.94(10)	⟨3,5 ⁻ ⟩		39(8)	61(15)								
1026.56(1)	5 ⁻		20.1(6)	12(1)	0.2(1)	56(1)				12.0(4)		0.6(3)
1038.2(1)	9 ⁺				26(11)			74(37)				
1095.51(1)	3 ⁻		89(1)	6.6(2)		1.8(2)	0.48(4)		0.27(4)	1.1(2)	0.46(5)	0.2(1)
1096.1(2)	7			100								
1139.44(1)	3		78.9(4)	6.7(2)		4.8(2)	1.3(2)		2.1(1)	3.4(2)	2.1(3)	0.8(2)
1172.4(3)	13 ⁺				100							
1192.3(1)	11 ⁺				100							
1205.14(1)	5 ⁺			1.5(1)		0.4(2)	13(1)	72.6(4)		0.4(1)		11.8(4)
1212.48(1)	5 ⁽⁻⁾		25.7(4)	18.6(2)		30.0(5)		1.2(1)	16(4)	8.6(1)		
1288.66(15)	1 ⁻					90(3)			10(3)			
1298.737(15)	3 ⁽⁻⁾		86(2)	1.4(3)					11(3)	1.9(8)		
1349.01(18)	1 ⁺		18(4)				20					62(9)
1378.72(5)	⟨7 ⁻ ,5 ⁺ ⟩	x	x					x		x		
1406.64(1)	5 ⁻ ,7 ⁻		1.0(2)	32(1)		20.5(8)			9.1(4)	32(1)		
1415.9(3)	1 ⁻ ,3,5 ⁻		62	25		12						
1422.00(10)	9 ⁻			81(5)						19(2)		
1449.8(3)										100		
1454.2(10)	⟨1 ⁺ ⟩										100	
1474(3)	⟨5 ⁺ ⟩							100				
1477.03(22)	11 ⁺				54(5)			46(3)				
1506.39(1)	5 ⁻ ,7 ⁻			45(1)	5.4(3)	25(1)			13(1)	8.5(9)		3.3(4)
1542.5(2)	⟨1 ⁺ ,3⟩	x					x					
1558.74(1)	5 ⁺			1.4(2)	3.4(2)	9.8(3)	78(1)					7.2(3)
1566.1(6)							100	x				
1598.53(2)	3 ⁻		15.3(2)	12.1(4)		53(2)	0.8(2)		1.1(4)	18(7)		
1629.19(1)	⟨3 ⁺ ,5 ⁻ ⟩		24(1)	0.7(2)		6(1)	11(1)	9(1)		30(2)		16(8)
1697.6(3)	9 ⁺							x				x
1743.42(2)	1 ⁻ ,3 ⁻		40(1)	2(1)		2.3(4)	3.3(6)			13(1)	37(4)	
1780.765(18)	5 ⁻ ,7 ⁻			48(3)	10(1)	6(2)	14(1)	17(6)				
1792.098(9)	⟨3 ⁺ ,5 ⁻ ⟩		0.4(2)	19		1	22(1)	10(1)	11(1)	18(2)	5(2)	
1801.13(7)	⟨5 ⁺ ,7⟩				7(1)		21(7)	71(5)				
1937.45(4)	⟨3 ⁺ ,5 ⁻ ⟩		58(1)	40(1)				2.1(13)				
1940.53(11)	⟨9 ⁺ ⟩		40(7)									
1965.06(7)	3 ⁻		100									

Energy levels and branching ratios [93Bh02]. Part 3

⁷¹₃₂Ge

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	1026.6 5 ⁻	1095.5 3 ⁻	1096.0 7	1172.4 13 ⁺	1192.3 11 ⁺	1298.7 3 ⁽⁻⁾	1349.0 1 ⁺	1378.7 ⟨7 ⁻ ,5 ⁺ ⟩	1422.0 9 ⁻	2314.2 15 ⁽⁺⁾
1378.72(5)	⟨7 ⁻ ,5 ⁺ ⟩			x								
1406.64(1)	5 ⁻ ,7 ⁻		3.8(8)	2(1)								
1629.19(1)	⟨3 ⁺ ,5 ⁻ ⟩			3(1)								
1743.42(2)	1 ⁻ ,3 ⁻							2(1)				
1780.765(18)	5 ⁻ ,7 ⁻		5(2)									
1792.098(9)	⟨3 ⁺ ,5 ⁻ ⟩		5(1)	8(2)					x			
1836.4										100		
1940.53(11)	⟨9 ⁺ ⟩									60(7)		
1949.2(4)					100							
1959.7(4)	11,13					58(11)	42(5)					
2298.7(5)	17 ⁽⁺⁾					100						
2314.18(11)	15 ⁽⁺⁾					41(18)	59(8)					
2348.8(4)	13 ⁻										100	
3681(3)												100

Energy levels and branching ratios [89Ki02].

⁷²₃₂Ge

E^* [keV]	J^π	L	S_N	σ (t,p) μb	ε	σ (t,p) $\mu b/sr$	L	C^2S' (τ,d)	σ (p,d) $\mu b/sr$	C^2S (p,d)	βR (α, α')	L	σ (p,t) $\mu b/sr$	$\Gamma_{\gamma f}$ [eV]	Ref.
0	0 ⁺	0	3.19*	1661	16	3560	1	2.50	340	0.52		0	4800		73Fo01
691.43(4)	0 ⁺	0	0.02	12		7	1	1.63	<2	<0.003		0	1370		73Fo01
834.011(20)	2 ⁺	2		386	2.1	132	1+3	0.3+0.4	210	0.04	1.00	2	1175		79Le07
1463.99(3)	2 ⁺					<2	1	0.09	70	0.01	0.16	2	149		75Ar08
1728.30(4)	4 ⁺	4		56	0.27	11	3	0.19	90	0.23	0.14		58		75Ar08
2029(3)	0 ⁺	0	0.12	59	0.63	118	1	0.02				⟨0⟩			80Ar14
2049(10)	4 ⁺								30	0.01		4			73Fo01
2064.93(3)	3 ⁺						1+3	0.03+0.3							75Ar08
2116.9(4)	1													1.1	95Ju01
2396.10(21)						6									79Mo08
2402.30(4)	2 ⁺	2		37	0.16	incl	1	0.40				2	265		75Ar08
2463.90(4)	4 ⁺	4		18	0.09	3	3	0.80				4	44		75Ar08
2505(5)									840	0.2+0.2					73Fo01
2514.79(3)	3 ⁻	3		323	6.5	77	4	1.90			0.83	3	415		75Ar08
2572(10)															
2583.5(4)															
2754.26(12)	⟨0 ⁺ ⟩	0	0.15	70	0.76	90	1+3	0.4+0.4	210	0.05					80Ar14
2772.11(15)	6 ⁺														
2875.61(21)															
2897(5)	0 ⁺	0		11	0.12	18	1	0.03							75Ar08
2939.96(5)	1 ⁻								40	0.11					73Fo01
2943.47(4)	3 ⁻	3		79	1.4	19					0.30				87Sc31

(continued)

⁷²Ge
³²

E^*	J^π	L	S_N	σ (t,p)	ε	σ (t,p)	L	C^2S'	σ (p,d)	C^2S	βR	L	σ (p,t)	$\Gamma_{\gamma f}$	Ref.
[keV]		(t,p)	(t,p)	μb	(t,p)	$\mu b/sr$		(τ, d)	$\mu b/sr$	(p,d)	(α, α')	(p,t)	$\mu b/sr$	[eV]	
2950.4(3)	1 ⁺ -3 ⁺						1+3	0.4+1.6				3	88		75Ar08
3034(3)	2 ⁺	2		132	0.71	39	1+3	1.8+1.8							75Ar08
3035.64(4)	2 ⁻					incl			60	0.22		$\langle 2 \rangle$	99		73Fo01
3080.33(21)	4 ⁺	4		354	1.7	59	3	4.95			0.41	4	144		75Ar08
3089.3(9)	1										0.13			1.2	95Ju01
3094.18(14)	2 ⁺						1+3	0.7+3.9				2	120	0.5	95Ju01
3129.01(13)	5 ⁻	5		60	0.33	14			250	0.06					73Fo01
3131(10)	$\langle 4^+ \rangle$										0.27				87Sc31
3139(3)	0 ⁺			11**								0	292		77Gu12
3182(3)	4 ⁺						3	1.32				4	31		75Ar08
3223(3)	X ⁺						1+3	0.5+0.6							75Ar08
3228(10)	X ⁻								220	0.06					73Fo01
3250(4)	3 ⁺ -5 ⁺														
3325.01(4)	$\langle 3 \rangle^-$					24	1+3	0.06+0.2	340	0.09					75Ar08
3327(3)	2 ⁺	2										2	419		77Gu12
3338.0(3)	1 $\langle + \rangle$													5.1	95Ju01
3341.76(4)	$\langle 2 \rangle^-$														
3358.4(24)	X ⁺						1+3	0.46+0.5							75Ar08
3378(3)	4 ⁺											4	34		77Gu12
3394(10)	5 ⁻								1150	0.3+0.5	0.28				87Sc31
3401.86(15)	$\langle 6^+ \rangle$														
3403(5)		$\langle 4 \rangle$				41									79Mo08
3409(10)	3 ⁻										0.17				87Sc31
3419.79(18)	2 ⁺											2	700		77Gu12
3427(5)	4 ⁺	4				28	1+3	0.49+0.5							75Ar08
3439.35(10)	X ⁺						1+3	0.07+2.4							75Ar08
3455.32(5)	2 ⁻ , 3 ⁻														
3468(3)	0 ⁻ -2 ⁻						4+2	0.73+0.1							75Ar08
3509(3)	2 ⁺						1+3	0.50+1.2				2	49		75Ar08
3511(10)	4 ⁺	$\langle 4 \rangle$				11					0.14				87Sc31
3528(3)	4 ⁺											4	119		77Gu12
3536(10)	1 ⁻										0.03				87Sc31
3550.66(17)	$\langle 1 \rangle^-$								290	0.1+0.2	0.06	$\langle 1 \rangle$	26		73Fo01
3565.9(3)	X $\langle - \rangle$														
3586(4)	0 ⁺	0		18**		145						0	77		77Gu12
3591(4)	3 ⁺ -5 ⁺														
3619.4(3)	2 ⁺	2				36	1	0.82							75Ar08
3624(10)												$\langle 2 \rangle$	22		77Gu12
3644(10)	X $\langle + \rangle$										0.06				87Sc31
3652(5)						26					0.06	$\langle 3 \rangle$			80Re04
3666.1(5)	1 ⁺						1+3	0.62+0.6	1180	0.3+1.4		$\langle 6 \rangle$	127	65	95Ju01
3667.41(24)	6 ⁺														
3678.08(8)	2 ⁻ , 3 ⁻	2													
3688(10)	6 ⁻ -8 ⁻														
3691(3)	1 ⁺ -3 ⁺					29	1+3	0.16+0.1							75Ar08

(continued)

⁷²Ge
³²

E^*	J^π	L	S_N	σ (t,p)	ε	σ (t,p)	L	C^2S'	σ (p,d)	C^2S	βR	L	σ (p,t)	$\Gamma_{\gamma f}$	Ref.
[keV]		(t,p)	(t,p)	μb	(t,p)	$\mu b/sr$		(τ, d)	$\mu b/sr$	(p,d)	(α, α')	(p,t)	$\mu b/sr$	[eV]	
3708.5(5)	2 ⁺											2	46		77Gu12
3722(10)	3 ⁻										0.08				87Sc31
3745(10)															
3757.2(4)	X ⁻								1570	0.4+0.9					73Fo01
3760.59(22)	8 ⁺														
3777(3)	3 ⁺ -5 ⁺			30**		48	1+3	0.25+0.6	incl		0.11				75Ar08
3784.29(18)	7 ⁻														
3803.55(6)	1,2 ⁺								incl						73Fo01
3815.4(3)	2 ⁻ ,3 ⁻						4+2	0.5+0.02			0.13				75Ar08
3821(3)	5 ⁻											5	55		77Gu12
3840.2(3)	4 ⁺	4				19					0.12				87Sc31
3858(10)	3 ⁺ -5 ⁺											4	20		77Gu12
3872.2(4)	2 ⁺														
3882(5)	1 ⁺ -3 ⁺	2				46									
3892(10)	$\langle 3^- \rangle$								340	1.23	0.17		288		73Fo01
3894.9(5)	1 ⁺						1+3	0.42+1.8						31	75Ar08
3898.58(22)	$\langle 7^- \rangle$														
3915(10)															
3937(10)	4 ⁻ -6 ⁻														
3965(10)	3 ⁻								500	0.2+0.5	0.12				73Fo01
3966(5)	2 ⁺	2				25									79Mo08
3983.75(16)												$\langle 2 \rangle$	79		77Gu12
3985.91(16)															
3995(10)	0 ⁻ -2 ⁻														
3995.24(25)	1 ⁺ ,2 ⁺			44**											
3995.9(4)	1 ⁽⁺⁾			incl		95								139	95Ju01
4004(10)															
4017(6)	4 ⁺					15	1+3	0.14+0.4				4	81		75Ar08
4027(5)	3 ⁺ -5 ⁺	4				incl									
4031(10)	5 ⁻										0.18				87Sc31
4041.0(5)	0 ⁻ -2 ⁻														
4046(10)	X ⁺						1+3	1.41+1.7			0.11				75Ar08
4047(10)	X ⁻								780	0.2+0.5					73Fo01
4049.5(3)	1													87	95Ju01
4065(10)	5 ⁻										0.11				87Sc31
4075.9(6)	5 ⁻											5	119		77Gu12
4077.66(22)	8 ⁺														
4082(10)	3 ⁺ -5 ⁺														
4090.4(6)	X ⁺						1+3	0.17+0.1							75Ar08
4108(3)	2 ⁺											2	45		77Gu12
4144(3)	4 ⁺										0.18	4	70		77Gu12
4147(5)	X ⁺						1+3	0.14+0.1							75Ar08
4171(3)	X ⁺						1+3	0.37+0.7							75Ar08
4191(3)	0 ⁺											0	207		77Gu12
4194(5)	X ⁻								780	0.27					73Fo01

(continued)

⁷²Ge
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E^*	J^π	L	S_N	σ (t,p)	ε	σ (t,p)	L	C^2S'	σ (p,d)	C^2S	βR	L	σ (p,t)	$\Gamma_{\gamma f}$	Ref.
[keV]		(t,p)	(t,p)	μb		(t,p)	$\mu b/sr$	(τ, d)	$\mu b/sr$	(p,d)	(α, α')	(p,t)	$\mu b/sr$	[eV]	
4228(3)	3^-						4+2	0.48+0.1			0.16	$\langle 3 \rangle$	74		75Ar08
4245(5)	X^+						3	0.60							75Ar08
4256.0(3)	1													52	95Ju01
4257(10)	$\langle 3^- \rangle$										0.10				87Sc31
4285(3)	3^-										0.16	3	54		77Gu12
4291.93(25)	X^+						1+3	0.25+0.8							75Ar08
4315(5)	X^+						1+3	0.33+0.1							75Ar08
4335(5)									970						
4358.6(3)	1													60	95Ju01
4369(10)	3^-										0.13				87Sc31
4374(5)	X^+						1+3	0.06+0.5							75Ar08
4419(5)							1+3				0.03				75Ar08
4454(3)	$\langle 2 \rangle^-$						4=0	2.38							75Ar08
4458(5)	X^-								660	0.27					73Fo01
4483(5)											0.21				87Sc31
4512(5)	$\langle 2 \rangle^-$						4+0	0.64							75Ar08
4521.0(2)												$\langle 2 \rangle$			80Re04
4534(10)	3^-										0.10				87Sc31
4575(5)							1+3				0.09				75Ar08
4601(10)															
4620(3)	X^+						1+3	0.12+0.3							75Ar08
4634(10)	$\langle 5^- \rangle$										0.17				87Sc31
4650(5)	X^-						4+2	0.5+0.05			0.14				75Ar08
4679(3)	X^-						4+2	1.1+0.06			0.12				75Ar08
4705(5)	$\langle 4^+ \rangle$										0.10				87Sc31
4724(10)	$\langle 3^- \rangle$										0.10				87Sc31
4741.44(23)	9^-														
4755(5)	X^-						4+2	0.4+0.05							75Ar08
4766(10)	$\langle 4^+ \rangle$										0.12				87Sc31
4804(10)	$\langle 4^+ \rangle$										0.11				87Sc31
4820.1(3)	$\langle 10^+ \rangle$														
4840(3)	X^+						1+3	0.08+0.2							75Ar08
4875	$X^{(+)}$						1+2				0.18				75Ar08
4903(5)	$\langle 4 \rangle^+$										0.13	4			80Re04
4926(10)															
4950.3(3)															
5004(5)															
5076(5)	$\langle 2 \rangle^-$						4=0	1.23							75Ar08
5082.6(3)															
5100(3)	X^-						4+2	1.7+0.09							75Ar08
5160(3)	X^-						4+2	1.3+0.07							75Ar08
5164.6(3)	1^+													108	95Ju01
5199.0(11)	1													86	95Ju01
5280.2(6)	1													105	95Ju01
5314.8(6)	1													126	95Ju01

(continued)

⁷²Ge
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E^*	J^π	L	S_N	σ (t,p)	ε	σ (t,p)	L	C^2S'	σ (p,d)	C^2S	βR	L	σ (p,t)	$\Gamma_{\gamma f}$	Ref.
[keV]		(t,p)	(t,p)	μb	(t,p)	$\mu b/sr$		(τ, d)	$\mu b/sr$	(p,d)	(α, α')	(p,t)	$\mu b/sr$	[eV]	
5395.7(3)															
5421.4(3)															
5435.6(5)	1 ⁺													182	95Ju01
5837.9(3)	11 ⁻														
5849.5(3)	1 ⁽⁻⁾													254	95Ju01
5919.5(4)	1 ⁻													349	95Ju01
5974.3(12)	1													160	95Ju01
6115.1(4)	12 ⁺														
6131.4(7)	1													185	95Ju01
6145.7(11)	1													99	95Ju01
6163.2(4)	1 ⁽⁻⁾													459	95Ju01
6382.9(7)	1													144	95Ju01
6469.7(7)	1													198	95Ju01
6629.6(5)	1													126	95Ju01
6736.5(6)	1													190	95Ju01
6811.4(12)	1 ⁻													254	95Ju01
7060.8(10)	1													494	95Ju01
7450.0(11)	1													261	95Ju01
7518.1(8)	1													376	95Ju01
7673.3(4)	1 ⁻													441	95Ju01
7804.5(13)	1 ⁽⁻⁾													724	95Ju01
8441.2(8)	1 ⁽⁻⁾													501	95Ju01
8486.4(10)	1													715	95Ju01
8867.3(5)	1													421	95Ju01
			80Ar14			79Le07		75Ar08		73Fo01			77Gu12		Ref.
						79Le07		79Mo08		73Fo01		87Sc31	80Re04	95Ju01	Ref.

Additional data on this isotope can be found in [02To0A, 89Ro12, 89Ca02, 87Fo06, 78Ar17].

Abundance: 27.31(26) %.

* Normalized to the experimental ⁶⁸Zn(⁶Li,d)⁷²Ge ground state transition [80Ar14].

** σ (t,p) from [84Mo07] (in this work $d\sigma/d\Omega=3850 \mu b/sr$ was found for the ground state).

For six levels a comparison of experimental and theoretical cross sections of the (p,t) reaction (parameter ε) was discussed in [74Ba67]; see other data in [80Re04].

Large value of the parameter $N=(d\sigma/d\Omega(\text{exp}))/ (d\sigma/d\Omega(\text{DWBA}))$ which has a meaning of S_N in case of two neutron transfer reaction ($\alpha, ^2\text{He}$) were attributed to the levels at $E^*=3760, 3784$ and 3990 keV [90Fi07].

Parameter of the (d,⁶Li) reaction $S'_\alpha=(2J+1)\sigma_{\text{exp}}/\sigma_{\text{DWBA}}$ was measured in the angular range from 0° to 30° at the energy 45 MeV [82Va08].

Energy levels and branching ratios [89Ki02]. Part 2

⁷²Ge
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E^* [keV]	J^π	L	S_N	L	R	L	S'_α	I_s	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage $E_f^*: 0$ $J_f^\pi: 0^+$
			(⁶ Li,d)	(p,d)	(p,t)		(d, ⁶ Li)	[eVb]			
0	0 ⁺	0	3.19	4	1.16	0	0.44		Stable	73Fo01	
691.43(4)	0 ⁺	0	0.27		0.37	0	0.14		444.2(8) ns	73Fo01	x
834.011(20)	2 ⁺			2		2	0.26		3.35(5) ps	79Le07	100
1463.99(3)	2 ⁺			2					4.5(+8-6) ps	75Ar08	12.4(2)
1728.30(4)	4 ⁺			4					1.55(16) ps	75Ar08	
2029(3)	0 ⁺	0	0.13							80Ar14	
2049(10)	4 ⁺			2						73Fo01	
2064.93(3)	3 ⁺								≥2 ps	75Ar08	
2116.9(4)	1							2.7(3)		95Ju01	
2396.10(21)										79Mo08	
2402.30(4)	2 ⁺				0.40					75Ar08	3.5(2)
2463.90(4)	4 ⁺				0.11				1.4(+35-7) ps	75Ar08	
2505(5)				1+4						73Fo01	
2514.79(3)	3 ⁻				0.58				4.7(9) ps	75Ar08	2.2(1)
2572(10)											
2583.5(4)											100
2754.26(12)	⟨0 ⁺ ⟩	0	0.66	1						80Ar14	
2772.11(15)	6 ⁺								0.7(+7-4) ps		
2875.61(21)											
2897(5)	0 ⁺									75Ar08	
2939.96(5)	1 ⁻			3						73Fo01	17(1)
2943.47(4)	3 ⁻									87Sc31	
2950.4(3)	1 ⁺ -3 ⁺									75Ar08	15(3)
3034(3)	2 ⁺									75Ar08	
3035.64(4)	2 ⁻			3						73Fo01	0.017(3)
3080.33(21)	4 ⁺				0.53					75Ar08	
3089.3(9)	1							1.5(7)		95Ju01	
3094.18(14)	2 ⁺				0.23			1.1(3)		95Ju01	46(9)
3129.01(13)	5 ⁻			1					3.5(+7-21) ps	73Fo01	
3131(10)	⟨4 ⁺ ⟩									87Sc31	
3139(3)	0 ⁺				0.10					77Gu12	
3182(3)	4 ⁺				0.095					75Ar08	
3223(3)	X ⁺									75Ar08	
3228(10)	X ⁻			1						73Fo01	
3250(4)	3 ⁺ -5 ⁺										
3325.01(4)	⟨3 ⁻ ⟩			1						75Ar08	0.014(4)
3327(3)	2 ⁺				0.8					77Gu12	
3338.0(3)	1 ^{⟨+} ⟩							5.3(12)		95Ju01	100
3341.76(4)	⟨2 ⁻ ⟩										
3358.4(24)	X ⁺									75Ar08	
3378(3)	4 ⁺				0.11					77Gu12	
3394(10)	5 ⁻			1+3						87Sc31	
3401.86(15)	⟨6 ⁺ ⟩								1(+4-1) ps		
3403(5)										79Mo08	
3409(10)	3 ⁻									87Sc31	

(continued)

⁷²Ge
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E^* [keV]	J^π	L	S_N	L	R	L	S'_α	I_s	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage	
			(⁶ Li,d)	(p,d)	(p,t)		(d, ⁶ Li)	[eVb]			E_f^* : 0	J_f^π : 0 ⁺
3419.79(18)	2 ⁺				1.10					77Gu12		
3427(5)	4 ⁺									75Ar08		
3439.35(10)	X ⁺									75Ar08		
3455.32(5)	2 ⁻ ,3 ⁻											
3468(3)	0 ⁻ -2 ⁻									75Ar08		
3509(3)	2 ⁺				0.10					75Ar08		
3511(10)	4 ⁺									87Sc31		
3528(3)	4 ⁺				0.47					77Gu12		
3536(10)	1 ⁻									87Sc31		
3550.66(17)	$\langle 1 \rangle^-$			1+3	0.37					73Fo01	26(2)	
3565.9(3)	X ⁽⁻⁾											
3586(4)	0 ⁺				0.028					77Gu12		
3591(4)	3 ⁺ -5 ⁺											
3619.4(3)	2 ⁺									75Ar08		
3624(10)					0.038					77Gu12		
3644(10)	X ⁽⁺⁾									87Sc31		
3652(5)										80Re04		
3666.1(5)	1 ⁺			1+4	0.76			41(5)		95Ju01		
3667.41(24)	6 ⁺								>2.1 ps			
3678.08(8)	2 ⁻ ,3 ⁻											
3688(10)	6 ⁻ -8 ⁻											
3691(3)	1 ⁺ -3 ⁺									75Ar08		
3708.5(5)	2 ⁺				0.10					77Gu12		
3722(10)	3 ⁻									87Sc31		
3745(10)												
3757.2(4)	X ⁻			1+3						73Fo01		
3760.59(22)	8 ⁺								0.8(+5-2) ps			
3777(3)	3 ⁺ -5 ⁺									75Ar08		
3784.29(18)	7 ⁻								≥2.8 ps			
3803.55(6)	1,2 ⁺			1+4						73Fo01	50(3)	
3815.4(3)	2 ⁻ ,3 ⁻									75Ar08		
3821(3)	5 ⁻				0.39					77Gu12		
3840.2(3)	4 ⁺									87Sc31		
3858(10)	3 ⁺ -5 ⁺				0.06					77Gu12		
3872.2(4)	2 ⁺										100	
3882(5)	1 ⁺ -3 ⁺											
3892(10)	$\langle 3^- \rangle$			3	0.46					73Fo01		
3894.9(5)	1 ⁺							16(4)		75Ar08		
3898.58(22)	$\langle 7^- \rangle$											
3915(10)												
3937(10)	4 ⁻ -6 ⁻											
3965(10)	3 ⁻			1+3						73Fo01		
3966(5)	2 ⁺									79Mo08		
3983.75(16)					0.15					77Gu12		
3985.91(16)												

(continued)

⁷²Ge
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E^* [keV]	J^π	L S_N (⁶ Li,d)	L (p,d)	R (p,t)	L S'_α (d, ⁶ Li)	I_s [eVb]	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage E_f^* : 0 J_f^π : 0 ⁺	
3995(10)	0 ⁻ -2 ⁻									
3995.24(25)	1 ⁺ ,2 ⁺								76(1)	
3995.9(4)	1 ⁽⁺⁾					101(12)		95Ju01		
4004(10)										
4017(6)	4 ⁺			0.28				75Ar08		
4027(5)	3 ⁺ -5 ⁺									
4031(10)	5 ⁻							87Sc31		
4041.0(5)	0 ⁻ -2 ⁻									
4046(10)	X ⁺							75Ar08		
4047(10)	X ⁻		1+3					73Fo01		
4049.5(3)	1					61(5)		95Ju01		
4065(10)	5 ⁻							87Sc31		
4075.9(6)	5 ⁻			1.0				77Gu12		
4077.66(22)	8 ⁺						0.8(+15-7) ps			
4082(10)	3 ⁺ -5 ⁺									
4090.4(6)	X ⁺							75Ar08		
4108(3)	2 ⁺			0.10				77Gu12		
4144(3)	4 ⁺			0.28				77Gu12		
4147(5)	X ⁺							75Ar08		
4171(3)	X ⁺							75Ar08		
4191(3)	0 ⁺							77Gu12		
4194(5)	X ⁻		1					73Fo01		
4228(3)	3 ⁻			0.14				75Ar08		
4245(5)	X ⁺							75Ar08		
4256.0(3)	1					33(6)		95Ju01		
4257(10)	$\langle 3^- \rangle$							87Sc31		
4285(3)	3 ⁻			0.14				77Gu12		
4291.93(25)	X ⁺						0.5(+7-1) ps	75Ar08		
4315(5)	X ⁺							75Ar08		
4335(5)										
4358.6(3)	1					37(4)		95Ju01		
4369(10)	3 ⁻							87Sc31		
4374(5)	X ⁺							75Ar08		
4419(5)								75Ar08		
4454(3)	$\langle 2^- \rangle$							75Ar08		
4458(5)	X ⁻		1					73Fo01		
4483(5)								87Sc31		
4512(5)	$\langle 2^- \rangle$							75Ar08		
4521.0(2)								80Re04		
4534(10)	3 ⁻							87Sc31		
4575(5)								75Ar08		
4601(10)										
4620(3)	X ⁺							75Ar08		
4634(10)	$\langle 5^- \rangle$							87Sc31		
4650(5)	X ⁻							75Ar08		

(continued)

⁷²Ge
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E^*	J^π	L	S_N	L	R	L	S'_α	I_s	$T_{1/2}$ or	Ref.	Branching ratios in percentage	
[keV]			(⁶ Li,d)	(p,d)	(p,t)		(d, ⁶ Li)	[eVb]	Γ_{cm}		E_f^* :	0
											J_f^π :	0 ⁺
4679(3)	X ⁻									75Ar08		
4705(5)	$\langle 4^+ \rangle$									87Sc31		
4724(10)	$\langle 3^- \rangle$									87Sc31		
4741.44(23)	9 ⁻								0.9(1) ps			
4755(5)	X ⁻									75Ar08		
4766(10)	$\langle 4^+ \rangle$									87Sc31		
4804(10)	$\langle 4^+ \rangle$									87Sc31		
4820.1(3)	$\langle 10^+ \rangle$								0.51(4) ps			
4840(3)	X ⁺									75Ar08		
4875	X ⁽⁺⁾									75Ar08		
4903(5)	$\langle 4 \rangle^+$									80Re04		
4926(10)												
4950.3(3)												
5004(5)												
5076(5)	$\langle 2 \rangle^-$									75Ar08		
5082.6(3)												
5100(3)	X ⁻									75Ar08		
5160(3)	X ⁻									75Ar08		
5164.6(3)	1 ⁺							47(6)		95Ju01		
5199.0(11)	1							37(5)		95Ju01		
5280.2(6)	1							43(5)		95Ju01		
5314.8(6)	1							52(9)		95Ju01		
5395.7(3)												
5421.4(3)												
5435.6(5)	1 ⁺							71(7)		95Ju01		
5837.9(3)	11 ⁻								0.9(2) ps			
5849.5(3)	1 ⁽⁻⁾							86(5)		95Ju01		
5919.5(4)	1 ⁻							115(8)		95Ju01		
5974.3(12)	1							52(5)		95Ju01		
6115.1(4)	$\langle 12^+ \rangle$								0.33(4) ps			
6131.4(7)	1							57(6)		95Ju01		
6145.7(11)	1							30(5)		95Ju01		
6163.2(4)	1 ⁽⁻⁾							60(6)		95Ju01		
6382.9(7)	1							41(5)		95Ju01		
6469.7(7)	1							54(6)		95Ju01		
6629.6(5)	1							33(6)		95Ju01		
6736.5(6)	1							48(6)		95Ju01		
6811.4(12)	1 ⁻							63(9)		95Ju01		
7060.8(10)	1							62(7)		95Ju01		
7450.0(11)	1							54(6)		95Ju01		
7518.1(8)	1							77(8)		95Ju01		
7673.3(4)	1 ⁻							86(7)		95Ju01		
7804.5(13)	1 ⁽⁻⁾							71(7)		95Ju01		
8441.2(8)	1 ⁽⁻⁾							81(11)		95Ju01		
8486.4(10)	1							51(7)		95Ju01		

(continued)

⁷²Ge
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E^*	J^π	L	S_N	L	R	L	S'_α	I_s	$T_{1/2}$ or	Ref.	Branching ratios in percentage	
[keV]			(⁶ Li,d)	(p,d)	(p,t)		(d, ⁶ Li)	[eVb]	Γ_{cm}		E_f^* : 0	J_f^π : 0 ⁺
8867.3(5)	1		80Ar14		77Gu12		82Va08	62(7)		95Ju01		
								95Ju01		Ref.		
										Ref.		

Energy levels and branching ratios [89Ki02]. Part 3

⁷²Ge
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E^*	J^π	Branching ratios in percentage									
[keV]		E_f^* : J_f^π :	691 0 ⁺	834 2 ⁺	1464 2 ⁺	1728 4 ⁺	2065 3 ⁺	2402 2 ⁺	2464 4 ⁺	2514.8 3 ⁻	2754.3 <0 ⁺ >
834.011(20)	2 ⁺		0.011								
1463.99(3)	2 ⁺		0.12(1)	88(1)							
1728.30(4)	4 ⁺			100							
2064.93(3)	3 ⁺			20(1)	78(1)	1.51(4)					
2396.10(21)					100						
2402.30(4)	2 ⁺		56(1)	29(1)	11(1)						
2463.90(4)	4 ⁺			2.7(5)	67(1)	31(1)					
2514.79(3)	3 ⁻			7.3(2)	60(1)	28(1)	0.8(2)	1.3(3)	0.09(1)		
2754.26(12)	<0 ⁺ >			100							
2772.11(15)	6 ⁺					100					
2875.61(21)					100						
2939.96(5)	1 ⁻		18(1)	36(1)	29(1)						
2943.47(4)	3 ⁻			47(1)		36(1)	3.2(2)		4.0(2)	10(2)	
2950.4(3)	1 ⁺ -3 ⁺			85(5)							
3035.64(4)	2 ⁻			93(2)	3.0(1)		4.0(1)			0.195(17)	
3080.33(21)	4 ⁺						100				
3094.18(14)	2 ⁺		43(2)				11(1)				
3129.01(13)	5 ⁻					39			11	28	
3325.01(4)	<3> ⁻		0.07(1)	35(1)	24(1)	20(2)	5.2(1)		4.2(1)	9.2(2)	
3341.76(4)	<2> ⁻			85(1)	1.54(4)		10.4(1)	1.73(4)			0.81(4)
3401.86(15)	<6> ⁺					43			46		
3419.79(18)	2 ⁺			72(17)						28(5)	
3439.35(10)	X ⁺			6(1)		14(3)		6.5(6)	10(3)	45(1)	
3455.32(5)	2 ⁻ ,3 ⁻			39(1)	33(1)		24(1)			2.1(2)	
3550.66(17)	<1> ⁻		25(5)	15(3)	18(1)			15(4)			
3565.9(3)	X< ⁻ >					92(5)	8.3(5)				
3619.4(3)	2 ⁺			74(4)					26(4)		
3666.1(5)	1 ⁺			52(9)		48(5)					
3678.08(8)	2 ⁻ ,3 ⁻			54(3)	25(3)		4.9(7)			10(2)	
3708.5(5)	2 ⁺									100	
3757.2(4)	X ⁻					85(4)					
3803.55(6)	1,2 ⁺		32(5)		18(1)						
3815.4(3)	2 ⁻ ,3 ⁻			100							

(continued)

⁷²₃₂Ge

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	691 0 ⁺	834 2 ⁺	1464 2 ⁺	1728 4 ⁺	2065 3 ⁺	2402 2 ⁺	2464 4 ⁺	2514.8 3 ⁻	2754.3 ⟨0 ⁺ ⟩
3983.75(16)				73(10)				27(6)			
3985.91(16)					71(4)				20(5)		
3995.24(25)	1 ⁺ , 2 ⁺		11(2)	12(1)							
4041.0(5)	0 ⁻ -2 ⁻			26(3)	74(10)						
4090.4(6)	X ⁺		57(9)	43(7)							

Energy levels and branching ratios [89Ki02]. Part 4

⁷²₃₂Ge

E^* [keV]	J^π	Branching ratios in percentage									
		$E_f^*:$ $J_f^\pi:$	2772.1 6 ⁺	2940.0 1 ⁻	2943.5 3 ⁻	3035.6 2 ⁻	3080.3 4 ⁺	3094.2 2 ⁺	3129.0 5 ⁻	3341.8 ⟨2⟩ ⁻	3401.9 ⟨6 ⁺ ⟩
3129.01(13)	5 ⁻	22									
3325.01(4)	⟨3⟩ ⁻				1.23(5)	0.88(6)		0.11(3)			
3341.76(4)	⟨2⟩ ⁻			0.216(13)		0.140(13)					
3401.86(15)	⟨6 ⁺ ⟩								11		
3439.35(10)	X ⁺				18(1)						
3455.32(5)	2 ⁻ , 3 ⁻									1.7(3)	
3667.41(24)	6 ⁺								100		
3678.08(8)	2 ⁻ , 3 ⁻			6.8(5)							
3760.59(22)	8 ⁺	100									
3784.29(18)	7 ⁻	50							50		
3840.2(3)	4 ⁺						100				
3898.58(22)	⟨7 ⁻ ⟩	100									
3985.91(16)						9(5)					
4077.66(22)	8 ⁺	86									
4291.93(25)	X ⁺	x									
4521.0(2)											100

Energy levels and branching ratios [89Ki02]. Part 5

⁷²₃₂Ge

E^* [keV]	J^π	Branching ratios in percentage								
		$E_f^*:$ $J_f^\pi:$	3439.3 X ⁺	3760.6 8 ⁺	3784.3 7 ⁻	3898.6 ⟨7 ⁻ ⟩	4075.9 5 ⁻	4077.7 8 ⁺	4741.4 9 ⁻	4820.1 ⟨10 ⁺ ⟩
3757.2(4)	X ⁻		15.1(14)							
4077.66(22)	8 ⁺			14						
4291.93(25)	X ⁺						x			
4741.44(23)	9 ⁻				80	20				
4820.1(3)	⟨10 ⁺ ⟩			100						
4950.3(3)					100					

(continued)

⁷²Ge
₃₂

E^*	J^π	E_f^* :	3439.3	3760.6	Branching ratios in percentage					
[keV]		J_f^π :	X ⁺	8 ⁺	3784.3	3898.6	4075.9	4077.7	4741.4	4820.1
					7 ⁻	$\langle 7^- \rangle$	5 ⁻	8 ⁺	9 ⁻	$\langle 10^+ \rangle$
5082.6(3)				100						
5395.7(3)						100				
5421.4(3)								100		
5837.9(3)	11 ⁻								100	
6115.1(4)	$\langle 12^+ \rangle$									100

Energy levels and branching ratios [04Si08].

⁷³Ge
₃₂

E^*	$2J^\pi$	L	$(2J+1)S$	$d\sigma/d\Omega$	S'	σ (d,p)	L	C^2S	σ (p,d)	$T_{1/2}$ or	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	Γ_{cm}	
0	9 ⁺	4	6.1	270	7.35	2020	4	3.39	920	Stable	73Ka03
13.285(2)	5 ⁺	2	0.30	160	0.28	800	2	0.23		2.92 μs	73Ka03
66.726(9)	1 ⁻	1	0.72	380	0.78	2880	1	0.59	1850	0.50(1) s	73Ka03
68.752(7)	$\langle 7 \rangle^+$					incl				1.7(1) ns	
353.68(12)	$\langle 5 \rangle^-$			360	0.59	1560	3	2.94			73Ka03
364.05(5)	3 ⁻	1	0.59			incl	1	1.14	6950		73Fo01
392.46(5)	3 ⁻	1	0.52	130	0.40	1560					73Ka03
499.09(12)	7 ⁺				0.58	1830				2.2(14) ps	72Ha74
501.37(15)	5 ⁺	2	0.72	430		incl	2	0.18	450		73Ka03
551(10)	$\langle 5-13 \rangle^+$										
554.94(12)	1 ⁺	0	0.11	160	0.054	970	0	0.02	120		73Ka03
597.79(9)	5 ⁻ , 7 ⁻						3	0.12			75ShYV
658.90(8)	9 ⁺	4	1.05	80	1.62	470					73Ka03
741.83(15)	$\langle 7^- \rangle$										
777.60(18)	3 ⁺ , 5 ⁺						2	0.01			75ShYV
809(2)	5 ⁻ , 7 ⁻						3	0.11			75ShYV
820(5)											
825.71(10)	$\langle 13 \rangle^+$									2.7(1) ps	
868.02(7)	$\langle 11 \rangle^+$										
894.1(4)	1 ⁻ , 3 ⁻	1	0.25	180	0.25	1440	1	0.11	500		73Ka03
904(5)	1 ⁻ , 3 ⁻	1			0.19	820					72Ha74
906.68(15)	$\langle 5^+ \rangle$										
915.82(19)	3 ⁺ , 5 ⁺						2	0.06			75ShYV
931.57(25)	$\langle 1^+ \rangle$			80							73Ka03
994.02(12)	$\langle 9^+ \rangle$										
1010.15(12)	$\langle 5^+ \rangle$										
1026(5)											
1039(4)	$\langle 5-13 \rangle^+$										
1043.27(14)	3 ⁻	1	0.16	110	0.16	970	1	0.44	1130		73Ka03
1130.27(22)	$\langle 9^- \rangle$										
1131.56(20)	$\langle 5-9 \rangle^+$										

(continued)

⁷³₃₂Ge

E^*	$2J^\pi$	L	$(2J+1)S$	$d\sigma/d\Omega$	S'	σ (d,p)	L	C^2S	σ (p,d)	$T_{1/2}$ or	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	Γ_{cm}	
1131.88(6)	1^-	1	0.14	80	0.23	1370					73Ka03
1133(3)	$5^-, 7^-$						3+1	0.14+0.02	140		73Fo01
1153(3)	$5^-, 7^-$						3	0.62			75ShYV
1192(3)							3+4	0.29+0.25	140		73Fo01
1262.90(20)	$1^-, 3^-$			40			1	0.08	250		73Ka03
1312.67(21)	$1^-, 3^-$						1	0.13	340		73Fo01
1318(10)	$\langle 5-13 \rangle^+$										
1339.7(3)	$\langle 5 \rangle^+$			40							73Ka03
1386.1(3)	$\langle 1^-, 3^- \rangle$										
1525.69(23)	$5^-, 7^-$						3	0.14			75ShYV
1544.7(16)											
1599(10)	1^+	$\langle 0 \rangle$	0.10	210	<0.01	170					73Ka03
1610.20(15)	$\langle 9 \rangle^+$										
1611(7)	$\langle 5, 7 \rangle^-$						3+4	0.39+0.21	150		73Fo01
1623(10)	5^+	2	1.32	1110	1.13	4390	2	0.05	70		73Ka03
1744(5)	1^+	0	0.45	1240	0.04	720	0	0.01	90		73Ka03
1757.89(25)	$7^+, 9^+$	4			0.86	290					72Ha74
1871.51(23)	$\langle 17^+ \rangle$										
1892.1(16)											
1912.4(6)	5^+	2	0.46	420	0.48	1960					73Ka03
1962(10)	5^+	2	0.25	250	0.25	1050					73Ka03
1992.7(3)	$3^+, 5^+$	2			0.06	240					72Ha74
2003.8(3)	$\langle 5^+ \rangle$										
2038.1(5)	$1^-, 3^-$				0.11	460	1	0.14	300		73Fo01
2066.0(5)	1^+	0	0.24	540							73Ka03
2088	$1^+ - 5^+$	2	0.27	200	0.27	570					73Ka03
2102.1(3)	$\langle 3^+, 5^+ \rangle$						$\langle 2 \rangle$	0.10	170		73Fo01
2132.7(16)	$1^-, 3^-$						1	0.05			75ShYV
2141.5(5)	$3^+, 5^+$						2	0.02			75ShYV
2188.8(5)	$1^-, 3^-$						1	0.01			75ShYV
2210.7(16)											
2217.1(3)	5^+	2	0.35	270	0.49	2130					73Ka03
2267(7)	$1^-, 3^-$						1	0.05	70		73Fo01
2291.0(16)											
2319.8(4)	3^+	2	0.24	140	0.24	1080					73Ka03
2335(5)	$1^-, 3^-$						1	0.06	160		73Fo01
2361.4(6)	$\langle 1^- \rangle$										
2374(10)	1^+	0	0.08	150							73Ka03
2401.8(16)											
2419.5(16)											
2454(10)	$\langle 3-15 \rangle^-$										
2459(10)	1^+	0	0.36	730	0.07	1320					73Ka03
2483.9(16)	$1^-, 3^-$						1	0.04			75ShYV
2508(7)	$1^-, 3^-$						1	0.04			75ShYV
2565.3(16)	$1^-, 3^-$						1	0.03			75ShYV

(continued)

⁷³Ge
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E^*	$2J^\pi$	L	$(2J+1)S$	$d\sigma/d\Omega$	S'	σ (d,p)	L	C^2S	σ (p,d)	$T_{1/2}$ or	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	Γ_{cm}	
2576(10)	5^+	2	0.48	300	0.32	1520					
2618(10)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.10	110							
2678(7)	$1^-, 3^-$		0.08	70			1	0.01			75ShYV
2696(7)	$1^-, 3^-$						1	0.02			75ShYV
2706.4(16)											
2720.7(16)											
2743(7)	$3^+, 5^+$	2	0.34	290	0.34	1630	2	0.01			75ShYV
2775.0(16)											
2796(7)	$5^-, 7^-$						3	0.14			75ShYV
2831(7)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.11	100							
2884.6(16)											
2915(10)	1^+	0	0.30	650	0.03	640					72Ha74
2930.6(16)											
2973(10)				80							73Ka03
3017(7)	$1^-, 3^-$						1	0.01			73Fo01
3037(7)	$1^-, 3^-$			120			1	0.02			73Ka03
3058(7)	$1^-, 3^-$										
3172(7)	$1^-, 3^-$			40			1	0.02			73Ka03
3223(15)				40							73Ka03
3277(15)				80							73Ka03
3305(15)				70							73Ka03
3356(7)	$1^-, 3^-$			40			1	0.02			73Ka03
3384(7)											
3418(15)	$3^+, 5^+$	2	0.11	170							73Ka03
3514(15)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.03	130							73Ka03
3551(15)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.07	200							73Ka03
3623(10)	$\langle 1-7 \rangle^-$						1+3	0.01+0.03			75ShYV
3631(7)											
3703(7)											
3727(15)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.04	330							
3766(15)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.02	110							
3805(10)				590							73Ka03
3849(15)				330							73Ka03
3924(7)	$1^-, 3^-$			450			1	0.01			73Ka03
3945(7)											
4000(7)				410							73Ka03
4059(7)											
4073(7)											
4370(7)											
4437(7)											
4569(7)											
4601(7)											
4653(7)											
4667(7)											

(continued)

⁷³₃₂Ge

E^*	$2J^\pi$	L	$(2J+1)S$	$d\sigma/d\Omega$	S'	σ (d,p)	L	C^2S	σ (p,d)	$T_{1/2}$ or	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	Γ_{cm}	
			73Ka03	73Ka03	72Ha74			75ShYV	73Fo01		Ref.
					72Ha74			73Fo01			Ref.

Additional data on this isotope can be found in [00KoZU, 91Is01, 90Ko49, 73BaWI].

Abundance: 7.76(8) %.Comparison of energy levels observed in the (n, γ) reaction with the levels from the (d,p) reaction was performed in [72Ha74].

Energy levels and branching ratios [04Si08]. Part 2

⁷³₃₂Ge

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]		E_f^* : $2J_f^\pi$:	0 9 ⁺	13.3 5 ⁺	66.7 1 ⁻	68.7 $\langle 7 \rangle^+$	353.7 $\langle 5 \rangle^-$	364 3 ⁻	392 3 ⁻	499 7 ⁺	501.37 5 ⁺	554.94 1 ⁺
13.285(2)	5 ⁺		100									
66.726(9)	1 ⁻			100								
68.752(7)	$\langle 7 \rangle^+$		100	x								
353.68(12)	$\langle 5 \rangle^-$			12.6(3)		87(4)						
364.05(5)	3 ⁻			0.26(4)	100(2)							
392.46(5)	3 ⁻			4.2(2)	96(2)							
499.09(12)	7 ⁺		2.4(4)	15(1)		83						
501.37(15)	5 ⁺			≤ 56		100						
554.94(12)	1 ⁺			83(17)	17(6)			x				
597.79(9)	5 ⁻ , 7 ⁻				56(2)			44(1)				
658.90(8)	9 ⁺		64(1)	11(1)		25(6)						
741.83(15)	$\langle 7^- \rangle$		>5				76(2)	20(1)				
777.60(18)	3 ⁺ , 5 ⁺			83(3)		17(3)						
825.71(10)	$\langle 13 \rangle^+$		100									
868.02(7)	$\langle 11 \rangle^+$		61			39(1)						
894.1(4)	1 ⁻ , 3 ⁻								100			
906.68(15)	$\langle 5^+ \rangle$		71(1)			29(4)						
915.82(19)	3 ⁺ , 5 ⁺		7(1)				93(3)					
931.57(25)	$\langle 1^+ \rangle$										100	
994.02(12)	$\langle 9^+ \rangle$		86(3)			8(3)						
1010.15(12)	$\langle 5^+ \rangle$		19(4)						31(3)			
1043.27(14)	3 ⁻			77(12)				12(4)	12(4)			
1130.27(22)	$\langle 9^- \rangle$						100					
1131.56(20)	$\langle 5-9 \rangle^+$					100						
1131.88(6)	1 ⁻				18(1)			20.0(11)	59(4)			2.1(5)
1262.90(20)	1 ⁻ , 3 ⁻			100								
1312.67(21)	1 ⁻ , 3 ⁻								100			
1339.7(3)	$\langle 5^+ \rangle$							61(16)				39(15)
1386.1(3)	$\langle 1^-, 3^- \rangle$								100			
1525.69(23)	5 ⁻ , 7 ⁻						10(3)					

(continued)

⁷³₃₂Ge

E^*	$2J^\pi$	Branching ratios in percentage										
[keV]	E_f^* : $2J_f^\pi$:	0 9 ⁺	13.3 5 ⁺	66.7 1 [−]	68.7 ⟨7⟩ ⁺	353.7 ⟨5⟩ [−]	364 3 [−]	392 3 [−]	499 7 ⁺	501.37 5 ⁺	554.94 1 ⁺	
1610.20(15)	⟨9⟩ ⁺	4(3)										
1912.4(6)	5 ⁺								100			
2003.8(3)	⟨5 ⁺ ⟩	45(9)						32(9)				
2038.1(5)	1 [−] , 3 [−]		100									
2141.5(5)	3 ⁺ , 5 ⁺				100							
2319.8(4)	3 ⁺								28(6)			

Energy levels and branching ratios [04Si08]. Part 3

⁷³₃₂Ge

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E_f^* : $2J_f^\pi$:	597.79 5 ⁻ , 7 ⁻	658.90 9 ⁺	741.83 $\langle 7^- \rangle$	777.60 3 ⁺ , 5 ⁺	825.71 $\langle 13 \rangle^+$	868.02 $\langle 11 \rangle^+$	906.68 $\langle 5^+ \rangle$	915.82 3 ⁺ , 5 ⁺	1130.27 $\langle 9^- \rangle$
994.02(12)	$\langle 9 \rangle^+$			6.0(8)							
1010.15(12)	$\langle 5^+ \rangle$		50(3)								
1131.88(6)	1 ⁻									1.4(4)	
1525.69(23)	5 ⁻ , 7 ⁻				90(13)						
1610.20(15)	$\langle 9 \rangle^+$			12.0(10)				84(5)			
1757.89(25)	7 ⁺ , 9 ⁺								100		
1871.51(23)	$\langle 17^+ \rangle$						100				
2003.8(3)	$\langle 5^+ \rangle$										23(5)
2102.1(3)	$\langle 3^+, 5^+ \rangle$					100					
2188.8(5)	1 ⁻ , 3 ⁻		100								
2319.8(4)	3 ⁺					72(18)					
2361.4(6)	$\langle 1^- \rangle$									100	

Energy levels and branching ratios [04Si08]. Part 4

⁷³₃₂Ge

E^*	$2J^\pi$	Branching ratios in percentage									
[keV]		E_f^* : $2J_f^\pi$:			1131.56		1131.88 1 ⁻				1262.90 1 ⁻ , 3 ⁻
1992.7(3)	3 ⁺ , 5 ⁺										100
2066.0(5)	1 ⁺							100			
2217.1(3)	5 ⁺				100						

Energy levels and branching ratios [95Fa23].

⁷⁴Ge
₃₂

E^*	J^π	L	σ (t,p)	ε	L	S'	L	C^2S	L	σ (p,t)	R	I_s	$\Gamma_{\gamma f}$	βR	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	(t,p)		(d,p)		(d, τ)	(p,t)	μb	(p,t)	[eVb]	[eV]	(α, α')	
0.0	0 ⁺	0	1580	17	4	0.45	1	0.32	0	6520	1.8				74Ba67
595.850(6)	2 ⁺	2	390	2.3	4+2	0.6,0.1	1+3	0.26+0.3	2	1395	1.05				83DoZV
1204.21(1)	2 ⁺	2	15	0.09			1+3	0.01+0.1	2	331	0.32			0.18	77Ro22
1463.76(1)	4 ⁺		<60		2	0.037	3	0.48		80				0.09	83DoZV
1482.81(4)	0 ⁺	0	323	3.8					0	107					74Ba67
1697.14(1)	$\langle 3 \rangle^+$		7				1+3	0.02+0.2		36					77Ro22
1724.95(1)	$\langle 0^+ \rangle$														
1913(14)	0 ⁺		2.8*												
2165(4)	$\langle 1^- \rangle$								4	54	0.125				
2165.26(1)	$\langle 3,4 \rangle^+$		16*				3	0.1							77Ro22
2197.93(2)	2 ⁺		39				1	0.02	2	303	0.43				77Ro22
2227.77(10)	0 ⁺	0	39	0.56			1	0.007							77Ro22
2300															
2403.5(4)	1											0.4(1)	0.4(1)		95Ju01
2490(5)															
2536.31(1)	3 ⁻	3	197	3.5					3	342	0.46			0.63	74Ba67
2569.33(1)	4 ⁺		<16						4	8.6	0.025			0.17	77Gu12
2600.32(9)	$\langle 1-3 \rangle^+$								$\langle 1 \rangle$	10.4	0.0023				77Gu12
2669.62(4)	4 ⁺	4	142	0.76					4	267	0.79			0.22	77Gu12
2690.6(3)	1											2.1(3)	1.5(3)		95Ju01
2693.68(4)	$\langle 3,4^+ \rangle$		<14												
2696.92(1)	$\langle 2^+ \rangle$									18				0.03	77Gu12
2711(6)	$\langle 4^+ \rangle$														
2752(5)	0 ⁺	0	13	0.16											79Le07
2828.51(1)	4 ⁺														
2835.92(2)	$\langle 2 \rangle^+$	2	145	0.79			1+3	0.15+0.3	2	155	0.23				77Ro22
2842(5)	$\langle 3^-, 5^- \rangle$				[1]	0.098								0.11	83DoZV
2861(3)	0 ⁺		<16				1+3	0.01+0.1	0	93	0.036				77Ro22
2877(5)	$\langle 5^- \rangle$														
2925.45(9)	$\langle 3,4^+ \rangle$														
2935.47(1)	3 ⁻				1	0.077								0.08	83DoZV
2936(5)	$\langle 5^- \rangle$														
2940(3)	2 ⁺	2	123	0.66			1+3	0.09+0.2	2	252	0.32				77Ro22
2949.48(10)	$\langle 3^- \rangle$														
2963(5)	$\langle 5^- \rangle$													0.08	87Sc31
2973.47(1)	$\langle 3 \rangle$														
3005(4)	2 ⁺													0.16	87Sc31
3017(3)	2 ⁺	2	183	1.1			1+3	0.15+0.2	2	785	1.4				77Ro22
3032.8(2)	1											11.7(5)	11(1)		95Ju01
3034.00(3)	$\langle 3,4^+ \rangle$														
3048.56(2)	4 ⁺	4	203	1.0					4	239	0.81			0.28	77Gu12
3060.1(5)	$\langle 2-6 \rangle$													0.10	87Sc31
3081.32(2)	$\langle 3^+ \rangle$						1+3	0.1+0.02							77Ro22
3092.2(2)	1 ⁽⁺⁾											6.8(5)	10(1)		95Ju01
3104.51(2)	5 ⁻								5	185	1.4			0.17	77Gu12

(continued)

⁷⁴Ge
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E^*	J^π	L	σ (t,p)	ε	L	S'	L	C^2S	L	σ (p,t)	R	I_s	$\Gamma_{\gamma f}$	βR	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	(t,p)		(d,p)		(d, τ)	(p,t)	μb	(p,t)	[eVb]	[eV]	(α, α')	
3119(5)	3^-6^-				1	0.26									83DoZV
3140.30(4)	3^-								3	506	0.95			0.34	77Gu12
3175.47(3)	3^-													0.15	87Sc31
3200(4)	2^+						3	0.21	2	138	0.28			0.13	77Ro22
3211.8(7)							3	0.10							77Ro22
3224.68(1)	4^+								4	110				0.21	77Gu12
3242(5)	$\leq 9^+$				4	0.56				22					83DoZV
3271.51(5)	$\langle 2^+ \rangle$														
3276.3(2)	1											1.4(4)	1.3(4)		95Ju01
3293(5)	3^-6^-				1	0.16									83DoZV
3315.72(3)	4^+						3	0.15						0.24	77Ro22
3342.94(7)	$\langle 3^-, 4^+ \rangle$														
3356(3)	0^+		75*												
3358.52(2)	$\langle 2^+-4^+ \rangle$														
3360(4)	5^-								5	94	0.75			0.15	77Gu12
3372.4(5)	$\langle 2^+-6^+ \rangle$														
3381.74(5)	3^-								3	52	0.10			0.22	77Gu12
3392.62(2)	2^+						1+3	0.15+0.3	2	33	0.055				77Ro22
3409.93(3)	$\langle 3, 4^+ \rangle$						1+3	0.08+0.3							77Ro22
3423.8(6)	$\langle 2-6 \rangle$														
3436.3(9)	$\langle 2-6 \rangle$														
3478.37(3)	$\langle 2, 3 \rangle^+$						1+3	0.09+0.3							77Ro22
3501.4(10)	4				4	0.086			4	214	0.77				83DoZV
3515.44(1)	$\langle 3, 4^+ \rangle$														
3557.9(3)	$1^{(-)}$											31(4)	50(8)		95Ju01
3566.75(8)	$\langle 2^+-4^+ \rangle$														
3578.93(3)	2^+						1+3	0.06,0.3	2	506	1.0				77Ro22
3603(5)					2	0.19									83DoZV
3617(7)	0^+								0	11.7	0.004			0.05	77Gu12
3629(7)	$\langle 6^+ \rangle$								[7]	64	[1.1]			0.12	90Fi07
3642(2)	$\langle 4^+ \rangle$														
3647.9(7)	1^+											25(6)	28(6)		95Ju01
3647(10)	1^-													0.03	87Sc31
3647(10)	2^+								2	54	0.10				77Gu12
3654(5)	$\langle 4^+, 5^+ \rangle$				[0]	0.007									83DoZV
3683(4)	5^-									91				0.15	77Gu12
3685.42(12)	$\langle 2-5^+ \rangle$														
3691.79(4)	3^-														
3696.59(9)	$\langle 3, 4 \rangle$														
3700(10)	$\langle 0^+ \rangle$				4	1.7									83DoZV
3707.20(14)	$\langle 3-5 \rangle$								$\langle 2 \rangle$	55	0.09				77Gu12
3716.7(4)	$\langle 1^-, 2^+ \rangle$														
3720.79(5)	$\langle 3, 4^+ \rangle$														
3733(7)	4^+													0.08	87Sc31
3743.35(2)	$\langle 3^-, 4^+ \rangle$														

(continued)

⁷⁴Ge
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E^*	J^π	L	σ (t,p)	ε	L	S'	L	C^2S	L	σ (p,t)	R	I_s	$\Gamma_{\gamma f}$	βR	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	(t,p)	(d,p)		(d, τ)		(p,t)	μb	(p,t)	[eVb]	[eV]	(α, α')	
3748(5)	2 ⁺								2	128	0.26			0.08	77Gu12
3771.74(5)	$\langle 2^+, 3, 4^+ \rangle$														
3778(5)	0 ⁺		59*						0	83	0.026				77Gu12
3783.41(5)	$\langle 2^+, 3, 4^+ \rangle$														
3790.90(8)	$\langle 3, 4^+ \rangle$														
3806.77(2)	3 ⁻													0.16	87Sc31
3807.03(11)															
3828.23(10)	$\langle 1^-, 4^+ \rangle$														
3832.23(5)	$\langle 2^+, 3, 4^+ \rangle$														
3835.27(4)	$\langle 2^+, 3, 4^+ \rangle$						1+3 0.05+0.16							0.14	77Ro22
3853(10)					1	0.12									83DoZV
3870	$\langle 7^-, 8^+ \rangle$														
3872(10)	2 ⁺								2	49	0.085				77Gu12
3874.9(3)	1 ⁺											76(14)	99(18)		95Ju01
3876(10)	3 ⁻													0.14	87Sc31
3889.69(3)	$\langle 2^+, 3, 4^+ \rangle$														
3895.01(6)	$\langle 2, 3, 4^+ \rangle$														
3897.98(4)	$\langle 2-6 \rangle$														
3916(5)	0 ⁺		41*						0	149	0.085				84Mo07
3932.98(4)	$\langle 1^+, 4^+ \rangle$														
3941.09(16)	$\langle 2^+, 3^- \rangle$														
3949.80(10)	$\langle 2^+, 3, 4^+ \rangle$													0.18	87Sc31
3958.03(20)	3 ⁻													0.12	87Sc31
3975.86(9)	$\langle 2^+ \rangle$														
3976.23(9)	$\langle 2, 3, 4^+ \rangle$														
3995.05(10)	$\langle 2^+, 3, 4^+ \rangle$														
3995.83(6)	$\langle 2^+ \rangle$														
3999(10)	5 ⁻													0.12	87Sc31
4006.8(4)	1											32(5)	44(6)		95Ju01
4008(10)	$\langle 0^+ \rangle$														
4022.94(7)	2 ⁺														
4024(7)	5 ⁻								5	115	1.18			0.19	77Gu12
4030.1(5)	$\langle 2^+, 3, 4^+ \rangle$														
4043(10)															
4064.66(3)	$\langle 2-5 \rangle$														
4069(5)	$\langle 3^-, 6^- \rangle$				1	0.17									83DoZV
4083(10)	$\langle 0^+ \rangle$														
4084.9(5)	1 ⁺											41(5)	60(8)		95Ju01
4085(10)	4 ⁺													0.12	87Sc31
4093(10)	$\langle 5^- \rangle$														
4119(5)	$\langle 3^-, 6^- \rangle$				1	0.12									83DoZV
4130	$\langle 7^-, 8^+ \rangle$														90Fi07
4138(10)	2 ⁺								2	136	0.28				77Gu12
4144.48(10)															
4155.25(13)															

(continued)

⁷⁴Ge
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E^*	J^π	L	σ (t,p)	ε	L	S'	L	C^2S	L	σ (p,t)	R	I_s	$\Gamma_{\gamma f}$	βR	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	(t,p)		(d,p)		(d, τ)	(p,t)	μb	(p,t)	[eVb]	[eV]	(α, α')	
4164(10)	2 ⁺								2	124	0.24				77Gu12
4171.5(3)	1											49(7)			95Ju01
4174(4)	3 ⁻				1	0.087									83DoZV
4191.32(5)															
4201.55(8)	2 ⁺														
4202.94(5)															
4204.67(16)	$\langle 2-5^- \rangle$														
4217.30(5)	$\langle 2^+-4^+ \rangle$														
4222.9(3)	$\langle 2^+-4^+ \rangle$														
4224.9(8)	1 ⁻											58(6)	90(10)		95Ju01
4234.77(6)	$\langle 3,4^+ \rangle$														
4235.33(13)	$\langle 2-4 \rangle^+$														
4239(10)	0 ⁺				2	0.079			0	71	0.027				83DoZV
4273(10)	$\langle 0^+ \rangle$								$\langle 0 \rangle$	160	0.068				77Gu12
4276.4(3)															
4290(7)	2 ⁺								2	106	0.28				77Gu12
4305.8(13)	1											29(4)	47(7)		95Ju01
4320(10)	4 ⁺								4	71	0.31				77Gu12
4339.67(5)	$\langle 2^+ \rangle$														
4342.6(3)	1											35(9)			95Ju01
4344.25(5)															
4353(5)	4 ⁺														
4367.2(5)	$\langle 1-5^- \rangle$														
4368.15(7)	$\langle 2^+ \rangle$														
4387(5)	2 ⁺				$\langle 2 \rangle$	0.060									83DoZV
4408.58(10)	$\langle 4^+ \rangle$								[0]	234	0.09				77Gu12
4413.54(10)	2 ⁺				2	0.10									83DoZV
4439.98(5)	$\langle 2-4 \rangle$														
4442.18(5)	$\langle 2^+-4^+ \rangle$														
4477.49(6)	$\langle \leq 4 \rangle$														
4493(7)	4 ⁺								4	63	0.33				77Gu12
4527.89(4)	$\langle 2^+ \rangle$														
4535(10)	0 ⁺				0	0.020			0	61	0.018				87Si08
4538(10)	2 ⁺														
4544(5)	4 ⁺ , 5 ⁺														
4586(9)	4 ⁺														
4591(10)	2 ⁺								2	88	0.22				77Gu12
4594(5)	3 ⁻ -6 ⁻				1	0.036									83DoZV
4611.4(2)	$\langle 2^--4^- \rangle$														
4630.43(7)	$\langle 2^+ \rangle$								$\langle 2 \rangle$	72	0.15				77Gu12
4664(10)	4 ⁺								4	99	0.48				77Gu12
4685(6)	$\langle 0^+ \rangle$								0	112	0.05				77Gu12
4698.3(1)	$\langle 2^--4^- \rangle$														
4731(5)	4 ⁺ , 5 ⁺				0	0.030									83DoZV
4767(11)	$\langle 0^+, 1^- \rangle$														

(continued)

⁷⁴Ge
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E^*	J^π	L	σ (t,p)	ε	L	S'	L	C^2S	L	σ (p,t)	R	I_s	$\Gamma_{\gamma f}$	βR	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	(t,p)		(d,p)	(d, τ)	(p,t)	μb	(p,t)	[eVb]	[eV]	(α, α')		
4824(5)	$4^+, 5^+$				0	0.015									83DoZV
4840.9(1)	$\langle 2^+ \rangle$														
4853(8)	$\langle 0^+, 2^+ \rangle$														
4874(5)															
4920(10)	$\langle 2^+ \rangle$							$\langle 2 \rangle$	92	0.21					77Gu12
4951(10)	$\langle 2^+ \rangle$							$\langle 2 \rangle$	91	0.25					77Gu12
4972.55(9)	$\langle 2^+ \rangle$														
4981(5)															
5021(10)	$\langle 2^+ \rangle$							$\langle 2 \rangle$	62	0.18					77Gu12
5062(5)	$4^+, 5^+$				0	0.032									83DoZV
5107.82(5)															
5131.45(8)	$\langle 2-6 \rangle$														
5147(5)	$4^+, 5^+$				0	0.047									83DoZV
5323(5)	$4^+, 5^+$				0	0.034									83DoZV
5352(10)															
5434.8(5)	1^-											104(8)	400(33)		95Ju01
5435.76(7)															
5485.1(12)	1											29(4)	75(11)		95Ju01
5493.1(10)	1											33(7)	87(17)		95Ju01
5514.8(8)	1											34(6)	234(42)		95Ju01
5580(10)	$\langle 0^+ \rangle$							$\langle 0 \rangle$		0.03					77Gu12
5617(5)															
5717(5)															
5743.7(10)	1											38(5)	110(13)		95Ju01
5758.76(4)															
5766.7(4)	$1^{\langle + \rangle}$											58(9)	167(27)		95Ju01
5787(5)															
5850(5)															
5926.86(6)															
5934.16(9)															
6018(4)	1^-														
6190															
6200	$\langle 6^+, 8^+ \rangle$														90Fi07
6330	$\langle 4^+, 5^+ \rangle$					$\langle 0 \rangle$									83DoZV
6445.1(11)	1											34(10)	393(113)		95Ju01
6477.9(6)	1^-											62(6)	226(21)		95Ju01
6530															
6650.3(3)	1^-											70(5)	918(69)		95Ju01
6660.5(5)	1^-											88(5)	337(20)		95Ju01
6680															
6732.7(8)	1^+											73(9)	287(34)		95Ju01
6862.00(7)															
6942.6(6)	1^-											84(7)	352(27)		95Ju01
6992.70(6)															
7150.8(16)	1^-											77(13)	581(94)		95Ju01

(continued)

⁷⁴Ge
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E^*	J^π	L	σ (t,p)	ε	L	S'	L	C^2S	L	σ (p,t)	R	I_s	$\Gamma_{\gamma f}$	βR	Ref.
[keV]		(t,p)	$\mu\text{b/sr}$	(t,p)	(d,p)	(d, τ)	(p,t)	μb	(p,t)	[eVb]	[eV]	(α, α')			
7173.18(4)															
7264.6(6)	1 ⁻											177(8)	811(34)		95Ju01
7275.90(4)															
7359.39(9)															
7379.9(10)	1											53(8)	249(36)		95Ju01
7445.3(11)	1											44(7)			95Ju01
7493.60(6)															
7506.7(10)	1 ⁽⁻⁾											82(7)	403(34)		95Ju01
7550.7(7)	1 ⁻											102(14)	795(106)		95Ju01
7578.96(5)															
7616.0(8)	1											50(7)			95Ju01
7621.77(7)															
7652.1(6)	1 ⁻											84(7)	1505(117)		95Ju01
7702.02(5)															
7882.23(4)															
7980.64(6)															
8219.0(8)	1											61(8)	358(49)		95Ju01
8250.2(8)	1											55(13)	325(77)		95Ju01
8361.1(12)	1											60(12)	875(176)		95Ju01
8375.70(8)															
8440.13(9)															
8560.09(6)															
8873.33(7)															
8928.00(8)															
9004.38(6)															
9133.79(8)															
9457.91(5)															
			79Le07	79Le07	87Si08	77Ro22	77Gu12			95Ju01	95Ju01	87Sc31	Ref.		Ref.
			84Mo07						77Gu12						

Additional data on this isotope can be found in [03Ko76, 02To0A, 02KoZU, 00To12, 91Is01, 89Ro12, 89Ca02, 87Sc31, 82Ta16, 78Ar17].

Abundance: 36.73(15) %.

* σ (t,p) from [84Mo07] (in this work $d\sigma/d\Omega=3790 \mu\text{b/sr}$ was found for the ground state), see also [78La12, 78Ve03].

For the (t,p) reaction S_N are normalized to the experimental $^{68}\text{Zn}(^6\text{Li},d)^{72}\text{Ge}$ ground state transition [80Ar14].

Parameters $N=(d\sigma/d\Omega_{exp})/(d\sigma/d\Omega_{DWBA})=5700(3500)$, 95(25), 50(12) for the ground state and levels with $E^*=3629$ and 4139 keV have a meaning of S_N in case of two neutron transfer reaction ($\alpha, ^2\text{He}$) [90Fi07].

Parameters from (p,p') reaction can be found in [82Ta16].

Parameter of the (d, ^6Li) reaction $S'_\alpha=(2J+1)\sigma_{exp}/\sigma_{DWBA}$ was measured in the angular range from 0° to 30° at the energy 45 MeV [82Va08].

Energy levels and branching ratios [95Fa23]. Part 2

⁷⁴Ge
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E^* [keV]	J^π	S_α (⁶ Li,d)	S_N (t,p)	σ (p,t) $\mu\text{b/sr}$	ε (p,t)	L (d, ⁶ Li)	S'_α (d, ⁶ Li)	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage			
										E_f^* : 0.0 J_f^π : 0 ⁺	596 2 ⁺	1204 2 ⁺	1464 4 ⁺
0.0	0 ⁺	1.74	3.38	620	8.7	0	0.48	Stable	74Ba67				
595.850(6)	2 ⁺			290	41	2	0.22	12.4(1) ps	83DoZV	100			
1204.21(1)	2 ⁺			58		2	0.06	5.1(5) ps	77Ro22	32(2)	68(1)		
1463.76(1)	4 ⁺			<10	<3.5	4	0.03	1.7(2) ps	83DoZV		100		
1482.81(4)	0 ⁺	1.23	0.76	<10	<2.5	0	<0.02	<2.6 ps	74Ba67	x	100		
1697.14(1)	$\langle 3 \rangle^+$								77Ro22		62(1)	36(1)	1.3(1)
1724.95(1)	$\langle 0^+ \rangle$											100	
1913(14)	0 ⁺												
2165(4)	$\langle 1^- \rangle$												
2165.26(1)	$\langle 3,4 \rangle^+$								77Ro22			67(1)	28.6(2)
2197.93(2)	2 ⁺								77Ro22	29(3)	16(1)	35(2)	9(1)
2227.77(10)	0 ⁺	≤ 0.04	0.11						77Ro22		100	x	
2300													
2403.5(4)	1								95Ju01				
2490(5)													
2536.31(1)	3 ⁻			40	0.6				74Ba67		75(1)	23(1)	
2569.33(1)	4 ⁺								77Gu12				100
2600.32(9)	$\langle 1-3 \rangle^+$								77Gu12		100		
2669.62(4)	4 ⁺								77Gu12		51(5)		38(5)
2690.6(3)	1								95Ju01				
2693.68(4)	$\langle 3,4^+ \rangle$										24(2)	76(2)	
2696.92(1)	$\langle 2^+ \rangle$								77Gu12				5.2(5)
2711(6)	$\langle 4^+ \rangle$												
2752(5)	0 ⁺	≤ 0.04	0.03						79Le07				
2828.51(1)	4 ⁺												
2835.92(2)	$\langle 2^+ \rangle$								77Ro22		18(2)		
2842(5)	$\langle 3^-, 5^- \rangle$								83DoZV				
2861(3)	0 ⁺								77Ro22				
2877(5)	$\langle 5^- \rangle$												
2925.45(9)	$\langle 3,4^+ \rangle$											16(1)	
2935.47(1)	3 ⁻								83DoZV				87(1)
2936(5)	$\langle 5^- \rangle$												
2940(3)	2 ⁺								77Ro22				
2949.48(10)	$\langle 3^- \rangle$										89(3)	9.6(3)	
2963(5)	$\langle 5^- \rangle$								87Sc31				
2973.47(1)	$\langle 3 \rangle$									1.8(2)			73(1)
3005(4)	2 ⁺								87Sc31				
3017(3)	2 ⁺								77Ro22				
3032.8(2)	1								95Ju01				
3034.00(3)	$\langle 3,4^+ \rangle$										6(1)	46(1)	24(1)
3048.56(2)	4 ⁺								77Gu12	4(1)		41(4)	
3060.1(5)	$\langle 2-6 \rangle$								87Sc31				
3081.32(2)	$\langle 3^+ \rangle$								77Ro22				53(2)
3092.2(2)	1 \langle^+								95Ju01				
3104.51(2)	5 ⁻								77Gu12				32(2)

(continued)

⁷⁴Ge
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E^*	J^π	S_α	S_N	σ (p,t)	ε	L	S'_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage			
[keV]		(⁶ Li,d)	(t,p)	$\mu\text{b/sr}$	(p,t)	(d, ⁶ Li)	(d, ⁶ Li)	Γ_{cm}		E_f^* : 0.0	596	1204	1464
										J_f^π : 0 ⁺	2 ⁺	2 ⁺	4 ⁺
3119(5)	3 ⁻ -6 ⁻								83DoZV				
3140.30(4)	3 ⁻								77Gu12				14(1)
3175.47(3)	3 ⁻								87Sc31		35(2)	6(1)	
3200(4)	2 ⁺								77Ro22				
3211.8(7)									77Ro22	x	x		
3224.68(1)	4 ⁺								77Gu12				
3242(5)	$\leq 9^+$								83DoZV				
3271.51(5)	$\langle 2^+ \rangle$												89(9)
3276.3(2)	1								95Ju01				
3293(5)	3 ⁻ -6 ⁻								83DoZV				
3315.72(3)	4 ⁺								77Ro22				
3342.94(7)	$\langle 3^-, 4^+ \rangle$										44(3)	44(2)	
3356(3)	0 ⁺												
3358.52(2)	$\langle 2^+-4^+ \rangle$												
3360(4)	5 ⁻								77Gu12				
3372.4(5)	$\langle 2^+-6^+ \rangle$												
3381.74(5)	3 ⁻								77Gu12		100		
3392.62(2)	2 ⁺								77Ro22				
3409.93(3)	$\langle 3, 4^+ \rangle$								77Ro22				12(2)
3423.8(6)	$\langle 2-6 \rangle$												
3436.3(9)	$\langle 2-6 \rangle$												
3478.37(3)	$\langle 2, 3 \rangle^+$								77Ro22				56(3)
3501.4(10)	4								83DoZV				
3515.44(1)	$\langle 3, 4^+ \rangle$												
3557.9(3)	1 ⁽⁻⁾								95Ju01				
3566.75(8)	$\langle 2^+-4^+ \rangle$										87(3)	13(2)	
3578.93(3)	2 ⁺								77Ro22	47(3)			24(3)
3603(5)									83DoZV				
3617(7)	0 ⁺	<1.44							77Gu12				
3629(7)	$\langle 6^+ \rangle$								90Fi07				
3642(2)	$\langle 4^+ \rangle$												
3647.9(7)	1 ⁺								95Ju01				
3647(10)	1 ⁻								87Sc31				
3647(10)	2 ⁺								77Gu12				
3654(5)	$\langle 4^+, 5^+ \rangle$								83DoZV				
3683(4)	5 ⁻								77Gu12				
3685.42(12)	$\langle 2-5^+ \rangle$												
3691.79(4)	3 ⁻												
3696.59(9)	$\langle 3, 4 \rangle$												8(8)
3700(10)	$\langle 0^+ \rangle$								83DoZV				
3707.20(14)	$\langle 3-5 \rangle$								77Gu12				
3716.7(4)	$\langle 1^-, 2^+ \rangle$									15(5)			
3720.79(5)	$\langle 3, 4^+ \rangle$												67(2)
3733(7)	4 ⁺								87Sc31				
3743.35(2)	$\langle 3^-, 4^+ \rangle$												

(continued)

⁷⁴₃₂Ge

E^*	J^π	S_α	S_N	σ (p,t)	ε	L	S'_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage			
[keV]		(⁶ Li,d)	(t,p)	$\mu\text{b/sr}$	(p,t)	(d, ⁶ Li)	(d, ⁶ Li)	Γ_{cm}		E_f^* : 0.0	596	1204	1464
										J_f^π : 0 ⁺	2 ⁺	2 ⁺	4 ⁺
3748(5)	2 ⁺								77Gu12				
3771.74(5)	$\langle 2^+, 3, 4^+ \rangle$											18(2)	2.7(5)
3778(5)	0 ⁺								77Gu12				
3783.41(5)	$\langle 2^+, 3, 4^+ \rangle$											70	
3790.90(8)	$\langle 3, 4^+ \rangle$												
3806.77(2)	3 ⁻								87Sc31		50(2)		38(1)
3807.03(11)										x			
3828.23(10)	$\langle 1^-, 4^+ \rangle$										24(3)	3	
3832.23(5)	$\langle 2^+, 3, 4^+ \rangle$												50(5)
3835.27(4)	$\langle 2^+, 3, 4^+ \rangle$								77Ro22		62(2)	15(2)	
3853(10)									83DoZV				
3870	$\langle 7^-, 8^+ \rangle$												
3872(10)	2 ⁺								77Gu12				
3874.9(3)	1 ⁺								95Ju01				
3876(10)	3 ⁻								87Sc31				
3889.69(3)	$\langle 2^+, 3, 4^+ \rangle$												
3895.01(6)	$\langle 2, 3, 4^+ \rangle$									2	16(2)	47(1)	
3897.98(4)	$\langle 2-6 \rangle$												
3916(5)	0 ⁺								84Mo07				
3932.98(4)	$\langle 1^+, 4^+ \rangle$												
3941.09(16)	$\langle 2^+, 3^- \rangle$												
3949.80(10)	$\langle 2^+, 3, 4^+ \rangle$								87Sc31		41(3)		4(2)
3958.03(20)	3 ⁻								87Sc31				
3975.86(9)	$\langle 2^+ \rangle$									22(2)		29(3)	
3976.23(9)	$\langle 2, 3, 4^+ \rangle$											4.5(8)	
3995.05(10)	$\langle 2^+, 3, 4^+ \rangle$									7(2)		93(8)	
3995.83(6)	$\langle 2^+ \rangle$									15(1)		8(1)	72(7)
3999(10)	5 ⁻								87Sc31				
4006.8(4)	1								95Ju01				
4008(10)	$\langle 0^+ \rangle$												
4022.94(7)	2 ⁺										32(2)		
4024(7)	5 ⁻								77Gu12				
4030.1(5)	$\langle 2^+, 3, 4^+ \rangle$										11(4)		
4043(10)													
4064.66(3)	$\langle 2-5 \rangle$												61(8)
4069(5)	$\langle 3^-, 6^- \rangle$								83DoZV				
4083(10)	$\langle 0^+ \rangle$												
4084.9(5)	1 ⁺								95Ju01				
4085(10)	4 ⁺								87Sc31				
4093(10)	$\langle 5^- \rangle$												
4119(5)	$\langle 3^-, 6^- \rangle$								83DoZV				
4130	$\langle 7^-, 8^+ \rangle$								90Fi07				
4138(10)	2 ⁺								77Gu12				
4144.48(10)													
4155.25(13)													

(continued)

⁷⁴Ge
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E^*	J^π	S_α	S_N	σ (p,t)	ε	L	S'_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage			
[keV]		(⁶ Li,d)	(t,p)	$\mu\text{b/sr}$	(p,t)	(d, ⁶ Li)	(d, ⁶ Li)	Γ_{cm}		E_f^* : 0.0	596	1204	1464
										J_f^π : 0 ⁺	2 ⁺	2 ⁺	4 ⁺
4164(10)	2 ⁺								77Gu12				
4171.5(3)	1								95Ju01				
4174(4)	3 ⁻								83DoZV				
4191.32(5)													
4201.55(8)	2 ⁺										17(2)	5(1)	5(1)
4202.94(5)													
4204.67(16)	$\langle 2-5^- \rangle$												
4217.30(5)	$\langle 2^+-4^+ \rangle$												46(4)
4222.9(3)	$\langle 2^+-4^+ \rangle$										33(15)	67(10)	
4224.9(8)	1 ⁻								95Ju01				
4234.77(6)	$\langle 3,4^+ \rangle$												
4235.33(13)	$\langle 2-4 \rangle^+$										21(5)	47(13)	
4239(10)	0 ⁺								83DoZV				
4273(10)	$\langle 0^+ \rangle$								77Gu12				
4276.4(3)													
4290(7)	2 ⁺								77Gu12				
4305.8(13)	1								95Ju01				
4320(10)	4 ⁺								77Gu12				
4339.67(5)	$\langle 2^+ \rangle$												
4342.6(3)	1								95Ju01				
4344.25(5)													
4353(5)	4 ⁺												
4367.2(5)	$\langle 1-5^- \rangle$												
4368.15(7)	$\langle 2^+ \rangle$									2.6(5)			
4387(5)	2 ⁺								83DoZV				
4408.58(10)	$\langle 4^+ \rangle$								77Gu12				
4413.54(10)	2 ⁺								83DoZV				17(2)
4439.98(5)	$\langle 2-4 \rangle$												
4442.18(5)	$\langle 2^+-4^+ \rangle$												
4477.49(6)	$\langle \leq 4 \rangle$											x	
4493(7)	4 ⁺								77Gu12				
4527.89(4)	$\langle 2^+ \rangle$												3(1)
4535(10)	0 ⁺								87Si08				
4538(10)	2 ⁺												
4544(5)	4 ⁺ , 5 ⁺												
4586(9)	4 ⁺												
4591(10)	2 ⁺								77Gu12				
4594(5)	3 ⁻ -6 ⁻								83DoZV				
4611.4(2)	$\langle 2^--4^- \rangle$												
4630.43(7)	$\langle 2^+ \rangle$								77Gu12	1.1(4)	11(1)		
4664(10)	4 ⁺								77Gu12				
4685(6)	$\langle 0^+ \rangle$								77Gu12				
4698.3(1)	$\langle 2^--4^- \rangle$												
4731(5)	4 ⁺ , 5 ⁺								83DoZV				
4767(11)	$\langle 0^+, 1^- \rangle$												

(continued)

⁷⁴Ge
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E^*	J^π	S_α	S_N	σ (p,t)	ε	L	S'_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]		(⁶ Li,d)	(t,p)	$\mu\text{b/sr}$	(p,t)	(d, ⁶ Li)	(d, ⁶ Li)	Γ_{cm}		E_f^* : 0.0	596	1204	1464	
										J_f^π : 0 ⁺	2 ⁺	2 ⁺	4 ⁺	
4824(5)	4 ⁺ ,5 ⁺								83DoZV					
4840.9(1)	$\langle 2^+ \rangle$									17(1)	8(1)		9(1)	
4853(8)	$\langle 0^+, 2^+ \rangle$													
4874(5)														
4920(10)	$\langle 2^+ \rangle$								77Gu12					
4951(10)	$\langle 2^+ \rangle$								77Gu12					
4972.55(9)	$\langle 2^+ \rangle$									11(1)				
4981(5)														
5021(10)	$\langle 2^+ \rangle$								77Gu12					
5062(5)	4 ⁺ ,5 ⁺								83DoZV					
5107.82(5)														
5131.45(8)	$\langle 2-6 \rangle$												13(2)	
5147(5)	4 ⁺ ,5 ⁺								83DoZV					
5323(5)	4 ⁺ ,5 ⁺								83DoZV					
5352(10)														
5434.8(5)	1 ⁻								95Ju01					
5435.76(7)														
5485.1(12)	1								95Ju01					
5493.1(10)	1								95Ju01					
5514.8(8)	1								95Ju01					
5580(10)	$\langle 0^+ \rangle$								77Gu12					
5617(5)														
5717(5)														
5743.7(10)	1								95Ju01					
5758.76(4)														
5766.7(4)	1 $\langle + \rangle$								95Ju01					
5787(5)														
5850(5)														
5926.86(6)														
5934.16(9)														
6018(4)	1 ⁻													
6190														
6200	$\langle 6^+, 8^+ \rangle$								90Fi07					
6330	$\langle 4^+, 5^+ \rangle$								83DoZV					
6445.1(11)	1								95Ju01					
6477.9(6)	1 ⁻								95Ju01					
6530														
6650.3(3)	1 ⁻								95Ju01					
6660.5(5)	1 ⁻								95Ju01					
6680														
6732.7(8)	1 ⁺								95Ju01					
6862.00(7)														
6942.6(6)	1 ⁻								95Ju01					
6992.70(6)														
7150.8(16)	1 ⁻								95Ju01					

(continued)

⁷⁴Ge
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E^*	J^π	S_α	S_N	σ (p,t)	ε	L	S'_α	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]		($^6\text{Li,d}$)	(t,p)	$\mu\text{b/sr}$	(p,t)	(d, ^6Li)	(d, ^6Li)	Γ_{cm}		E_f^* :	0.0	596	1204	1464
										J_f^π :	0 $^+$	2 $^+$	2 $^+$	4 $^+$
7173.18(4)														
7264.6(6)	1 $^-$								95Ju01					
7275.90(4)														
7359.39(9)														
7379.9(10)	1								95Ju01					
7445.3(11)	1								95Ju01					
7493.60(6)														
7506.7(10)	1 $^{\langle- \rangle}$								95Ju01					
7550.7(7)	1 $^-$								95Ju01					
7578.96(5)														
7616.0(8)	1								95Ju01					
7621.77(7)														
7652.1(6)	1 $^-$								95Ju01					
7702.02(5)														
7882.23(4)														
7980.64(6)														
8219.0(8)	1								95Ju01					
8250.2(8)	1								95Ju01					
8361.1(12)	1								95Ju01					
8375.70(8)														
8440.13(9)														
8560.09(6)														
8873.33(7)														
8928.00(8)														
9004.38(6)														
9133.79(8)														
9457.91(5)														
		80Ar14	80Ar14	74Ba67			82Va08		Ref.					
						82Va08			Ref.					

Energy levels and branching ratios [95Fa23]. Part 3

⁷⁴Ge
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E^*	J^π	Branching ratios in percentage										
[keV]		E_f^* : J_f^π :	1483 0 ⁺	1697 ⟨3⟩ ⁺	1725 ⟨0 ⁺ ⟩	2165 ⟨1 [−] ⟩	2165.3 ⟨3,4⟩ ⁺	2197.9 2 ⁺	2227.8 0 ⁺	2536.3 3 [−]	2569.3 4 ⁺	2600.3
<hr/>												
2165.26(1)	⟨3,4⟩ ⁺			4.4(2)								
2197.93(2)	2 ⁺		12(1)									
2536.31(1)	3 [−]			2.1(2)								
2669.62(4)	4 ⁺			11(1)								
2696.92(1)	⟨2 ⁺ ⟩			87(1)		7.3(2)						
2828.51(1)	4 ⁺			99(2)		1.2(1)						
2835.92(2)	⟨2⟩ ⁺			78(5)		4.5(5)						

(continued)

⁷⁴Ge
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E^* [keV]	J^π	E_f^* : J_f^π :	1483 0 ⁺	1697 ⟨3⟩ ⁺	1725 ⟨0 ⁺ ⟩	2165 ⟨1 ⁻ ⟩	2165.3 ⟨3,4⟩ ⁺	2197.9 2 ⁺	2227.8 0 ⁺	2536.3 3 ⁻	2569.3 4 ⁺	2600.3
Branching ratios in percentage												
2925.45(9)	⟨3,4 ⁺ ⟩			84(3)								
2935.47(1)	3 ⁻						12.2(2)			0.37(3)		
2949.48(10)	⟨3 ⁻ ⟩						1.3(2)					
2973.47(1)	⟨3⟩						24(1)			0.6(1)		
3005(4)	2 ⁺								x			
3034.00(3)	⟨3,4 ⁺ ⟩			<39						24(2)		
3048.56(2)	4 ⁺						41(1)	14				
3081.32(2)	⟨3 ⁺ ⟩			30(2)			11(1)			6.3(2)		
3104.51(2)	5 ⁻						68(1)					
3140.30(4)	3 ⁻			<70			5.2(6)	25(1)		56(4)		
3175.47(3)	3 ⁻			9(1)						23(1)		
3271.51(5)	⟨2 ⁺ ⟩				4(1)				7(2)			
3315.72(3)	4 ⁺						88(3)				12(1)	
3342.94(7)	⟨3 ⁻ ,4 ⁺ ⟩						13(1)					
3358.52(2)	⟨2 ⁺ -4 ⁺ ⟩							49(5)				
3392.62(2)	2 ⁺						65(1)					
3409.93(3)	⟨3,4 ⁺ ⟩			76(5)								
3478.37(3)	⟨2,3⟩ ⁺						28(2)			4(2)		
3515.44(1)	⟨3,4 ⁺ ⟩						35(2)					
3696.59(9)	⟨3,4⟩			32(3)						50(4)		
3707.20(14)	⟨3-5⟩									100		
3720.79(5)	⟨3,4 ⁺ ⟩			20(5)						11(1)		
3771.74(5)	⟨2 ⁺ ,3,4 ⁺ ⟩							74(3)				
3790.90(8)	⟨3,4 ⁺ ⟩									95(3)		
3807.03(11)				x								
3828.23(10)	⟨1 ⁻ -4 ⁺ ⟩			8				4(3)				
3895.01(6)	⟨2,3,4 ⁺ ⟩			15(1)						15(1)		
3932.98(4)	⟨1 ⁺ -4 ⁺ ⟩						10(1)					
3941.09(16)	⟨2 ⁺ ,3 ⁻ ⟩			14(1)		43(4)						
3975.86(9)	⟨2 ⁺ ⟩			5(1)								
3976.23(9)	⟨2,3,4 ⁺ ⟩			96(4)								
4030.1(5)	⟨2 ⁺ ,3,4 ⁺ ⟩										89(26)	
4201.55(8)	2 ⁺			31(3)			8(2)	24(2)				
4217.30(5)	⟨2 ⁺ -4 ⁺ ⟩							30(4)				
4339.67(5)	⟨2 ⁺ ⟩								10(1)			33(8)
4368.15(7)	⟨2 ⁺ ⟩						4(1)					
4413.54(10)	2 ⁺			8(1)								
4439.98(5)	⟨2-4⟩			54(5)								24(3)
4442.18(5)	⟨2 ⁺ -4 ⁺ ⟩										19(2)	
4527.89(4)	⟨2 ⁺ ⟩	15(2)					8(1)				5(1)	
4611.4(2)	⟨2 ⁻ -4 ⁻ ⟩									58(8)		
4630.43(7)	⟨2 ⁺ ⟩				15(1)					6(1)		
4840.9(1)	⟨2 ⁺ ⟩					3(1)						
4972.55(9)	⟨2 ⁺ ⟩	5(1)	3(1)									
5131.45(8)	⟨2-6⟩						11(1)				33(3)	

Energy levels and branching ratios [95Fa23]. Part 4

⁷⁴Ge
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E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	2669.6 4 ⁺	2693.7 ⟨3,4 ⁺ ⟩	2696.9 ⟨2 ⁺ ⟩	2828.5 4 ⁺	2835.9 ⟨2 ⁺ ⟩ ⁺	2935.5 3 ⁻	2949.5 ⟨3 ⁻ ⟩	2973.5 ⟨3⟩	3034.0 ⟨3,4 ⁺ ⟩	3048.6 4 ⁺
3175.47(3)	3 ⁻			20(4)							7(2)	
3224.68(1)	4 ⁺					16(1)		62(1)		21(1)		
3358.52(2)	⟨2 ⁺ -4 ⁺ ⟩					51(2)						
3392.62(2)	2 ⁺				19.5(4)		4.9(4)					
3409.93(3)	⟨3,4 ⁺ ⟩				5.6(3)	2.4(5)	3.9(3)					
3478.37(3)	⟨2,3⟩ ⁺										2(1)	4(1)
3515.44(1)	⟨3,4 ⁺ ⟩					3	3(1)	33(1)		26(1)		
3578.93(3)	2 ⁺							30(1)				
3691.79(4)	3 ⁻	51(10)						23.2(25)			26.3(15)	
3771.74(5)	⟨2 ⁺ ,3,4 ⁺ ⟩											5.7(5)
3828.23(10)	⟨1 ⁻ -4 ⁺ ⟩			15(2)								
3832.23(5)	⟨2 ⁺ ,3,4 ⁺ ⟩					27(7)	12(3)					
3835.27(4)	⟨2 ⁺ ,3,4 ⁺ ⟩											8(1)
3889.69(3)	⟨2 ⁺ ,3,4 ⁺ ⟩											85(7)
3932.98(4)	⟨1 ⁺ -4 ⁺ ⟩				78(14)							
3941.09(16)	⟨2 ⁺ ,3 ⁻ ⟩					43(6)						
3949.80(10)	⟨2 ⁺ ,3,4 ⁺ ⟩								15(5)			
3958.03(20)	3 ⁻				100							
3975.86(9)	⟨2 ⁺ ⟩			44(7)								
4022.94(7)	2 ⁺							56(6)				
4204.67(16)	⟨2-5 ⁻ ⟩	13(2)						41(5)				
4217.30(5)	⟨2 ⁺ -4 ⁺ ⟩						13(2)					
4367.2(5)	⟨1-5 ⁻ ⟩								44(4)			
4368.15(7)	⟨2 ⁺ ⟩					15(1)				12(3)		
4442.18(5)	⟨2 ⁺ -4 ⁺ ⟩											8(2)
4477.49(6)	⟨≤4⟩										x	
4698.3(1)	⟨2 ⁻ -4 ⁻ ⟩			36(4)								
4840.9(1)	⟨2 ⁺ ⟩	2.0(1)										
4972.55(9)	⟨2 ⁺ ⟩							20(2)				
5131.45(8)	⟨2-6⟩											5(1)

Energy levels and branching ratios [95Fa23]. Part 5

⁷⁴Ge
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E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	3081.3 ⟨3 ⁺ ⟩	3104.5 5 ⁻	3140.3 3 ⁻	3175.5 3 ⁻	3224.7 4 ⁺	3271.5 ⟨2 ⁺ ⟩	3315.7 4 ⁺	3342.9 ⟨3 ⁻ ,4 ⁺ ⟩	3358.5	3381.7 3 ⁻
3392.62(2)	2 ⁺	10(1)										
3478.37(3)	⟨2,3⟩ ⁺					6(1)						
3685.42(12)	⟨2-5 ⁺ ⟩	100										
3696.59(9)	⟨3,4⟩					10(2)						
3716.7(4)	⟨1 ⁻ ,2 ⁺ ⟩					85(15)						
3720.79(5)	⟨3,4 ⁺ ⟩					2.5(7)						

(continued)

⁷⁴Ge
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E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	3081.3 $\langle 3^+ \rangle$	3104.5 5^-	3140.3 3^-	3175.5 3^-	3224.7 4^+	3271.5 $\langle 2^+ \rangle$	3315.7 4^+	3342.9 $\langle 3^-, 4^+ \rangle$	3358.5	3381.7 3^-
3743.35(2)	$\langle 3^-, 4^+ \rangle$			71(2)		6(2)		23(7)				
3783.41(5)	$\langle 2^+, 3, 4^+ \rangle$								30(7)			
3790.90(8)	$\langle 3, 4^+ \rangle$							5.1(13)				
3828.23(10)	$\langle 1^-, 4^+ \rangle$					3(1)				43(2)		
3832.23(5)	$\langle 2^+, 3, 4^+ \rangle$				5(1)			6				
3835.27(4)	$\langle 2^+, 3, 4^+ \rangle$										14(4)	
3895.01(6)	$\langle 2, 3, 4^+ \rangle$									5(1)		
3949.80(10)	$\langle 2^+, 3, 4^+ \rangle$				17(4)							
4201.55(8)	2^+					7(1)						
4204.67(16)	$\langle 2^-, 5^- \rangle$							30(13)				
4217.30(5)	$\langle 2^+, 4^+ \rangle$		11(2)									
4339.67(5)	$\langle 2^+ \rangle$		49(2)									
4367.2(5)	$\langle 1^-, 5^- \rangle$									56(11)		
4368.15(7)	$\langle 2^+ \rangle$			46(6)							21(5)	
4439.98(5)	$\langle 2^-, 4^+ \rangle$											13(3)
4442.18(5)	$\langle 2^+, 4^+ \rangle$				8(1)							
4477.49(6)	$\langle \leq 4 \rangle$				x					x		
4527.89(4)	$\langle 2^+ \rangle$						16(2)					
4611.4(2)	$\langle 2^-, 4^- \rangle$				42(5)							
4840.9(1)	$\langle 2^+ \rangle$			21(6)							24(4)	

Energy levels and branching ratios [95Fa23]. Part 6

⁷⁴Ge
₃₂

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	3392.6 2^+	3409.9 $\langle 3, 4^+ \rangle$	3478.4 $\langle 2, 3 \rangle^+$	3515.4 $\langle 3, 4^+ \rangle$	3566.7	3578.9 2^+	3691.8 3^-	3696.6 $\langle 3, 4 \rangle$	3720.8 $\langle 3, 4^+ \rangle$	3743.4 $\langle 3^-, 4^+ \rangle$
3806.77(2)	3^-					12(2)						
3889.69(3)	$\langle 2^+, 3, 4^+ \rangle$											15(3)
3897.98(4)	$\langle 2^-, 6^+ \rangle$				100							
3932.98(4)	$\langle 1^+, 4^+ \rangle$										7(2)	5(1)
3949.80(10)	$\langle 2^+, 3, 4^+ \rangle$				22(3)							
4022.94(7)	2^+							12(3)				
4064.66(3)	$\langle 2^-, 5^+ \rangle$			28(1)								
4201.55(8)	2^+									5(1)		
4339.67(5)	$\langle 2^+ \rangle$								2.4(5)		2.4(5)	
4442.18(5)	$\langle 2^+, 4^+ \rangle$		10(1)						5			
4477.49(6)	$\langle \leq 4 \rangle$				x							
4527.89(4)	$\langle 2^+ \rangle$				23(2)							32(1)
4698.3(1)	$\langle 2^-, 4^- \rangle$						64(4)					
4972.55(9)	$\langle 2^+ \rangle$							7(1)				
5131.45(8)	$\langle 2^-, 6^+ \rangle$		34(9)									

Energy levels and branching ratios [95Fa23]. Part 7

⁷⁴Ge
₃₂

E^*	J^π	E_f^* : J_f^π :	3771.7	3783.4	3806.8 3 ⁻	3835.3	3876 3 ⁻	3889.7	3976.2
[keV]									
3995.83(6)	$\langle 2^+ \rangle$			4(1)					
4064.66(3)	$\langle 2-5 \rangle$							10(2)	
4235.33(13)	$\langle 2-4 \rangle^+$								32(8)
4413.54(10)	2 ⁺				75(18)				
4442.18(5)	$\langle 2^+-4^+ \rangle$					50(12)			
4840.9(1)	$\langle 2^+ \rangle$						11(2)		
4972.55(9)	$\langle 2^+ \rangle$		53(18)						

Energy levels and branching ratios [95Fa23]. Part 8

⁷⁴Ge
₃₂

E^*	J^π	E_f^* : J_f^π :	4043	4119 $\langle 3^--6^- \rangle$	4155.2	4217.3	4339.7 $\langle 2^+ \rangle$	4440.0 $\langle 2-4 \rangle$
[keV]								
4204.67(16)	$\langle 2-5^- \rangle$		16(4)					
4339.67(5)	$\langle 2^+ \rangle$					3.2(6)		
4439.98(5)	$\langle 2-4 \rangle$						9(2)	
4630.43(7)	$\langle 2^+ \rangle$			67(22)				
4840.9(1)	$\langle 2^+ \rangle$				5			
5131.45(8)	$\langle 2-6 \rangle$							3(1)

Energy levels and branching ratios [99Fa05].

⁷⁵Ge
₃₂

E^*	$2J^\pi$	L	S'	σ (d,p)	S'	σ (d,p)	L	S_N	σ (t,p)	L	C^2S	σ (p,d)	L	S'	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$	(t,p)	(t,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	(d,t)	(d,t)	
0.0 61.89(9)	1 ⁻	1	0.663	460	0.73	3840	5	0.025*	1.4(3)	1	0.7**	2600	1	0.52	88BuZV
139.69(3)	7 ⁺	4	0.092	10			2+4	0.4,0.2	12.3(8)	4	0.16	incl			88BuZV
192.18(7)	5 ⁺											1200	2	0.17	88BuZV
199.89(11)	9 ⁺	4	4.55	280	4.80	1370	0	0.56	3186(500)	4	4.75	incl	4	3.57	88BuZV
253.10(6)	3 ⁻	1	0.108	110	0.13	690				1	0.17	650	1		72Ha74
316.85(7)	5 ⁻	3	0.771	110	1.29	530				3	2.17	550	3	1.28	88BuZV
457.05(7)	5 ⁻	3	0.205	60						3	0.33	120	$\langle 3 \rangle$		88BuZV
574.69(6)	3 ⁻				0.77	4360				1	1.58	600	1	1.55	75ShYV
584.41(8)	5 ⁺	2	0.845	850		incl	2+6	0.2,0.06	5.9(6)	2	0.25	incl			88BuZV
651(2)	5 ⁻ ,7 ⁻									3	0.05				75ShYV
673.65(8)	1 ⁺	0	0.043	160	0.043	760				0	0.01	150	$\langle 0 \rangle$		88BuZV
762.10(9)	$\langle 3 \rangle$	$\langle 1,2 \rangle$	0.01												88BuZV
885.46(7)	1 ⁻	1	0.294	280	0.31	1860				1	0.16	480	1	0.15	88BuZV

(continued)

⁷⁵₃₂Ge

E^*	$2J^\pi$	L	S'	σ (d,p)	S'	σ (d,p)	L	S_N	σ (t,p)	L	C^2S	σ (p,d)	L	S'	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$	(t,p)	(t,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	(d,t)	(d,t)	
901.3															
947.2															
986.8(14)	$\langle 5-9 \rangle^+$	$\langle 2,4 \rangle$	0.08				2+6	0.5,0.2	15.2(9)						88BuZV
1062.2(4)	5^+-13^+						2	0.41	12.1(9)						87Fo09
1080.6															
1128.0(5)															
1136.9(1)	3^-	1	0.117	170	0.34	1270							1	0.066	88BuZV
1190(5)	9^+						0+2	0.03,0.2	162(4)						87Fo09
1222.9				100											
1240.7(2)	$\langle 5 \rangle^-$	3	0.273	incl						3	0.26				88BuZV
1257.0(3)	$\langle 7^+ \rangle$			incl						$\langle 4 \rangle$	0.32	3	+4	0.59	88BuZV
1335.2															
1394.4(1)	5^+	2	0.291	270	0.29	1350				2	0.08				88BuZV
1408(4)	9^+					incl	0+2	0.01,0.3	82(4)				1	0.24	87Fo09
1416.2(3)	$1^-, 3^-$									1	0.19	620			75ShYV
1427.4(2)	$\langle 1,3 \rangle$														
1494.6															
1501.5(1)	$1^-, 3^-$									1	0.50	1300	1	0.44	75ShYV
1514.4(1)	1^+	0	0.55	1830	0.37	7000									88BuZV
1537.7(3)	5^+	2	0.27		0.27	1080	2+4	0.5,0.5	20.7(10)	2	0.05				88BuZV
1602.8(19)	$5^-, 7^-$									3	0.76	180	3	0.44	75ShYV
1682(4)	9^+						0	0.026	171(8)	4	0.19				87Fo09
1688.36	$\langle 1,3,5^+ \rangle$									[3]	0.21	120			75ShYV
1696(9)												incl	$\langle 4 \rangle$	0.45	88BuZV
1718.5(1)	5^+	2	0.66	820	0.87	3520	2	1.21	41(2)						88BuZV
1759.6(1)	$\langle 1,3,5^+ \rangle$														
1796.3(2)	$1^-, 3^-$									1	0.22	600	1	0.18	75ShYV
1869.4(1)	3^+	2	0.14	200	0.27	1180									88BuZV
1901(8)	9^+						0+2	0.005,0.1	28(2)						87Fo09
2003.9(2)	3^+	2	0.19	210	0.30	1320	4+2	0.22,0.07				160			87Fo09
2054(11)				80								incl			
2069.0(17)												incl			
2094.8(17)				20								incl			
2103.7(2)															
2110.1(6)		$\langle 0 \rangle$	0.02	80					7.0(6)						88BuZV
2127(5)	5^+-13^+						2+6	0.08,0.1	4.1(8)						87Fo09
2151(10)															
2197.1(6)				130											
2214.8(4)	$\langle 5^+ \rangle$						2	0.24	9.3(8)						87Fo09
2281(3)															
2320(6)	9^+														
2321(2)	$1^-, 3^-$	1	0.06	20	0.11	290	0+2	0.03,0.1	21(1)	1	0.19	450			88BuZV
2359(4)	$1^-, 3^-$									1	0.04	incl			75ShYV
2382.8(2)	5^+	2	0.17	210	0.21	980									88BuZV
2384(3)	9^+						0=4	0.005,0.1	33(1)	4	0.4				87Fo09

(continued)

⁷⁵Ge
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E^*	$2J^\pi$	L	S'	σ (d,p)	S'	σ (d,p)	L	S_N	σ (t,p)	L	C^2S	σ (p,d)	L	S'	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$	(t,p)	(t,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	(d,t)	(d,t)	
2478(4)	$7^+, 9^+$	4	0.34	160			2	0.54	18(1)						88BuZV
2527.2(3)	$3^+, 5^+$	2	0.12		0.15	720									88BuZV
2534(4)	$5^-, 7^-$			110						3	0.22				75ShYV
2572(4)	$1^-, 3^-$			incl						1	0.03				75ShYV
2574.2(17)	$3^+, 5^+$	2	0.67		0.13	630									88BuZV
2660.7(2)	$1^-, 3^-$	1	0.16	460	0.084	1630						190			88BuZV
2664.4(2)	$\langle 1, 3, 5 \rangle$			incl						[1]	0.12	incl			75ShYV
2665.0(4)	$\langle \leq 7 \rangle$						3	0.66	9.1(7)			incl			87Fo09
2740(6)	$3^-, 15^-$						3	0.63	13(1)						87Fo09
2748.5(23)	$3^+, 5^+$	2	0.09	150											88BuZV
2759.1(7)															
2781(8)	9^+						0+2	0.006,0.1	45(3)						87Fo09
2835(8)	$3^-, 15^-$						3	0.73	10.5(7)						87Fo09
2836(3)	$3^+, 5^+$	2	0.11	120											88BuZV
2852.8(4)	$\langle 1^-, 3^- \rangle$									1	0.03				75ShYV
2939(7)	$3^-, 15^-$			80			3	1.54	23(1)						87Fo09
2954(4)															
3031.6(6)	$3^+, 5^+$	2	0.11	110											88BuZV
3042(9)	$\langle 9^+ \rangle$						0+2	0.006,0.6	50(3)						87Fo09
3048.7(9)	$3^+, 5^+$	2	0.48	140											88BuZV
3067.3(4)	1^+	0	0.10	240											88BuZV
3082.3(4)	1^+	0	0.10	240											88BuZV
3092(16)	$3^-, 15^-$						3	0.87	12(1)						87Fo09
3126(3)	$3^+, 5^+$	2	0.03	310											88BuZV
3136(11)	9^+						0+2	0.006,0.5	52(2)						87Fo09
3162.9(5)	$1^-, 3^-$			80						1	0.03				75ShYV
3182(7)															
3194(7)															
3214(3)	5^+	2	0.05	680			2	1.06	29(1)						88BuZV
3279.6(5)	7^-						1+3	0.2,1.56	40(2)						87Fo09
3290.3(5)	$\langle 3 \rangle^+$	2	0.28	80											88BuZV
3361(4)	$3^+, 5^+$	2	0.04	190											88BuZV
3370(16)	$7^-, 11^-$						1	0.26	54(2)						87Fo09
3393(7)	$3^+, 5^+$	2	0.06	240											88BuZV
3438(5)	$3^+, 5^+$	2	0.09												88BuZV
3450(4)	$7^-, 11^-$			50			1=5	0.08,0.9	29(1)						87Fo09
3494(7)				80											
3532(15)				70											
3560(15)				40											
3626(7)	$X^{(-)}$									1+3	0.03				75ShYV
3719(6)	$\langle 1^+ \rangle$	0	0.07	220											88BuZV
3759(15)				80											
3812(15)				160											
3839(6)				370											

(continued)

⁷⁵Ge
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E^*	$2J^\pi$	L	S'	σ (d,p)	S'	σ (d,p)	L	S_N	σ (t,p)	L	C^2S	σ (p,d)	L	S'	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$	(t,p)	(t,p)	$\mu\text{b/sr}$		(p,d)	$\mu\text{b/sr}$	(d,t)	(d,t)	
3862(15)			73Ka03	73Ka03	72Ha74	72Ha74		87Fo09	87Fo09		99Fa05	73Fo01		88BuZV	Ref.

Additional data on this isotope can be found in [91Is01].

* For two-neutron transfer $S_N=(2J+1)\varepsilon/10(2L+1)$, where ε is enhancement factor, see [99Fa05].** C^2S for $J^\pi=1/2^-$ [75ShYV, 99Fa05]. Other values are calculated for the following spins: for $L=1$, $J^\pi=3/2^-$; for $L=2$, $J^\pi=5/2^+$; for $L=3$, $J^\pi=5/2^-$ and when $L=4$, $J^\pi=9/2^+$; such assumptions are based upon the shell model.Values $(2J+1)S$ for deuteron stripping (d,p) reaction are adopted in [99Fa05] from [88BuZV, 76Yo04, 73Ka03]; cross sections σ (d,p) are from [73Ka03]; cross sections of two-neutron transfer reaction (t,p) are from [87Fo09].Cross section of neutron pickup reaction σ (p,d) are from [73Fo01].Comparison of energy levels observed in the (n, γ) reaction with the levels from the (d,p) reaction was performed in [72Ha74].

Energy levels and branching ratios [99Fa05]. Part 2

⁷⁵Ge
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E^*	$2J^\pi$	$T_{1/2}$ or	Ref.	Branching ratios in percentage							
[keV]		Γ_{cm}		E_f^* :	0.0	61.9	139.7	192.2	199.9	253.1	316.8
				$2J_f^\pi$:	1^-		7^+	5^+	9^+	3^-	5^-
0.0	1^-	82.78(4) m	88BuZV								
61.89(9)					100						
139.69(3)	7^+	47.7(5) s	88BuZV		100	0.008(4)					
192.18(7)	5^+	216(5) ns	88BuZV				100				
199.89(11)	9^+		88BuZV				100				
253.10(6)	3^-		72Ha74		100						
316.85(7)	5^-		88BuZV		33(2)		60(2)	7(2)			
457.05(7)	5^-		88BuZV		50(5)					50(3)	
574.69(6)	3^-		75ShYV		94(3)					5(1)	0.9(4)
584.41(8)	5^+		88BuZV		47(3)		50(2)	4(1)			
651(2)	$5^-, 7^-$		75ShYV								
673.65(8)	1^+		88BuZV		25(4)			75(6)			
762.10(9)	$\langle 3 \rangle$		88BuZV		31(14)			35(6)			35(5)
885.46(7)	1^-		88BuZV		38					16(2)	5(1)
901.3											
947.2									100		
986.8(14)	$\langle 5-9 \rangle^+$		88BuZV								
1062.2(4)	5^+-13^+		87Fo09						100		
1080.6								100			
1128.0(5)								100			
1136.9(1)	3^-		88BuZV		23(4)					6(2)	44(4)
1190(5)	9^+		87Fo09								
1222.9					x						

(continued)

⁷⁵Ge
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E^* [keV]	$2J^\pi$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage							
				E_f^* : $2J_f^\pi$:	0.0 1 ⁻	61.9	139.7 7 ⁺	192.2 5 ⁺	199.9 9 ⁺	253.1 3 ⁻	316.8 5 ⁻
1240.7(2)	$\langle 5 \rangle^-$		88BuZV		6(2)					31(4)	11(4)
1257.0(3)	$\langle 7^+ \rangle$		88BuZV								
1335.2									100		
1394.4(1)	5 ⁺		88BuZV				68(5)	17(4)			
1408(4)	9 ⁺		87Fo09				100				
1416.2(3)	1 ⁻ , 3 ⁻		75ShYV		52(10)						
1427.4(2)	$\langle 1, 3 \rangle$				38(8)					62(8)	
1494.6								100			
1501.5(1)	1 ⁻ , 3 ⁻		75ShYV		23(3)					29(2)	
1514.4(1)	1 ⁺		88BuZV		74(3)						
1537.7(3)	5 ⁺		88BuZV				65(12)	35(9)			
1602.8(19)	5 ⁻ , 7 ⁻		75ShYV								
1682(4)	9 ⁺		87Fo09								
1688.36	$\langle 1, 3, 5^+ \rangle$		75ShYV								
1696(9)			88BuZV								
1718.5(1)	5 ⁺		88BuZV				61(3)	8(1)		17(2)	
1759.6(1)	$\langle 1, 3, 5^+ \rangle$										
1796.3(2)	1 ⁻ , 3 ⁻		75ShYV		35(6)					65(5)	
1869.4(1)	3 ⁺		88BuZV		5(2)						
1901(8)	9 ⁺		87Fo09								
2003.9(2)	3 ⁺		87Fo09					58(6)			
2054(11)											
2069.0(17)											
2094.8(17)											
2103.7(2)					100						
2110.1(6)			88BuZV				45(15)				
2127(5)	5 ⁺ –13 ⁺		87Fo09								
2151(10)											
2197.1(6)											
2214.8(4)	$\langle 5^+ \rangle$		87Fo09				62(19)				
2281(3)											
2320(6)	9 ⁺										
2321(2)	1 ⁻ , 3 ⁻		88BuZV								
2359(4)	1 ⁻ , 3 ⁻		75ShYV								
2382.8(2)	5 ⁺		88BuZV								
2384(3)	9 ⁺		87Fo09								
2478(4)	7 ⁺ , 9 ⁺		88BuZV								
2527.2(3)	3 ⁺ , 5 ⁺		88BuZV					15(5)			
2534(4)	5 ⁻ , 7 ⁻		75ShYV								
2572(4)	1 ⁻ , 3 ⁻		75ShYV								
2574.2(17)	3 ⁺ , 5 ⁺		88BuZV								
2660.7(2)	1 ⁻ , 3 ⁻		88BuZV								
2664.4(2)	$\langle 1, 3, 5 \rangle$		75ShYV								
2665.0(4)	$\langle \leq 7 \rangle$		87Fo09							x	
2740(6)	3 ⁻ –15 ⁻		87Fo09								

(continued)

⁷⁵Ge
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E^* [keV]	$2J^\pi$	$T_{1/2}$ or Γ_{cm}	Ref.	Branching ratios in percentage							
				E_f^* : $2J_f^\pi$:	0.0 1 ⁻	61.9	139.7 7 ⁺	192.2 5 ⁺	199.9 9 ⁺	253.1 3 ⁻	316.8 5 ⁻
2748.5(23)	3 ⁺ ,5 ⁺		88BuZV								
2759.1(7)										100	
2781(8)	9 ⁺		87Fo09								
2835(8)	3 ⁻ –15 ⁻		87Fo09								
2836(3)	3 ⁺ ,5 ⁺		88BuZV								
2852.8(4)	⟨1 ⁻ ,3 ⁻ ⟩		75ShYV				27(9)	15(7)		23(9)	
2939(7)	3 ⁻ –15 ⁻		87Fo09								
2954(4)											
3031.6(6)	3 ⁺ ,5 ⁺		88BuZV								
3042(9)	⟨9 ⁺ ⟩		87Fo09								
3048.7(9)	3 ⁺ ,5 ⁺		88BuZV					100			
3067.3(4)	1 ⁺		88BuZV							11(7)	
3082.3(4)	1 ⁺		88BuZV		24(11)			26(11)			
3092(16)	3 ⁻ –15 ⁻		87Fo09								
3126(3)	3 ⁺ ,5 ⁺		88BuZV								
3136(11)	9 ⁺		87Fo09								
3162.9(5)	1 ⁻ ,3 ⁻		75ShYV							34(8)	
3182(7)											
3194(7)											
3214(3)	5 ⁺		88BuZV								
3279.6(5)	7 ⁻		87Fo09							59(14)	
3290.3(5)	⟨3 ⁺ ⟩		88BuZV		79(20)						
3361(4)	3 ⁺ ,5 ⁺		88BuZV								
3370(16)	7 ⁻ –11 ⁻		87Fo09								
3393(7)	3 ⁺ ,5 ⁺		88BuZV								
3438(5)	3 ⁺ ,5 ⁺		88BuZV								
3450(4)	7 ⁻ –11 ⁻		87Fo09								
3494(7)											
3532(15)											
3560(15)											
3626(7)	X ⁽⁻⁾		75ShYV								
3719(6)	⟨1 ⁺ ⟩		88BuZV								
3759(15)											
3812(15)											
3839(6)											
3862(15)											
			Ref.								

Energy levels and branching ratios [99Fa05]. Part 3

⁷⁵Ge
₃₂

E^* [keV]	$2J^\pi$	$E_f^*:$ $2J_f^\pi:$	457.0 5 ⁻	574.69 3 ⁻	584.41 5 ⁺	Branching ratios in percentage							1080.6
						673.65 1 ⁺	762.10 ⟨3⟩	885.46 1 ⁻	901.3	947.2	1062.2 5 ⁺ -13 ⁺		
885.46(7)	1 ⁻		3.7(10)	23(2)	12		2.7(10)						
901.3			100										
1136.9(1)	3 ⁻		14(3)	6(2)					9(1)				
1222.9				100									
1240.7(2)	⟨5⟩ ⁻		40	12(6)									
1257.0(3)	⟨7 ⁺ ⟩		100										
1394.4(1)	5 ⁺				10(2)		5(2)						
1416.2(3)	1 ⁻ ,3 ⁻			48(16)									
1501.5(1)	1 ⁻ ,3 ⁻		13(1)	34(3)									
1514.4(1)	1 ⁺			10(1)		13(1)	3(1)						
1718.5(1)	5 ⁺		7(1)	2(1)	2(1)		3(1)						
1796.3(2)	1 ⁻ ,3 ⁻			x									
1869.4(1)	3 ⁺		39(6)		46(6)	10(4)							
2003.9(2)	3 ⁺		34(4)										
2110.1(6)										55(22)			
2197.1(6)											50		
2214.8(4)	⟨5 ⁺ ⟩						38(14)						
2382.8(2)	5 ⁺			16(3)	8(2)		56(4)						10(2)
2527.2(3)	3 ⁺ ,5 ⁺				14(5)	71(11)							
2660.7(2)	1 ⁻ ,3 ⁻			10(2)			78(9)	12(4)					
2664.4(2)	⟨1,3,5⟩			x									
2852.8(4)	⟨1 ⁻ ,3 ⁻ ⟩				21(9)								
3031.6(6)	3 ⁺ ,5 ⁺						100						
3067.3(4)	1 ⁺	12(9)					78(16)						
3082.3(4)	1 ⁺			50(12)									
3162.9(5)	1 ⁻ ,3 ⁻					10(2)	20(7)						
3279.6(5)	7 ⁻			18(9)			23(9)						
3290.3(5)	⟨3⟩ ⁺							21(13)					

Energy levels and branching ratios [99Fa05]. Part 4

⁷⁵Ge
₃₂

E^* [keV]	$2J^\pi$	$E_f^*:$ $2J_f^\pi:$	1128.0	Branching ratios in percentage			1494.6
				1136.90 3 ⁻	1335.2	1394.40 5 ⁺	
2003.9(2)	3 ⁺			8(2)			
2197.1(6)					50		
2382.8(2)	5 ⁺						10(2)
2852.8(4)	⟨1 ⁻ ,3 ⁻ ⟩					15(6)	
3162.9(5)	1 ⁻ ,3 ⁻		37(8)				

Energy levels and branching ratios [84Si14, 95Si03].

⁷⁶Ge
₃₂

E^*	J^π	L	σ (t,p)	ε	σ (t,p)	L	S'_α	L	βR	I_s	$\Gamma_{\gamma f}$	$T_{1/2}$ or	Ref.
[keV]		(t,p)	μb	(t,p)	$\mu b/sr$	(d, ⁶ Li)	(d, ⁶ Li)		(α, α')	[eVb]	[meV]	Γ_{cm}	
0.0	0 ⁺	0	2210	28	4580	0	0.51	0				Stable	84Mo07
562.93(3)	2 ⁺	2	372	2.1	87	2	0.27	2	1.21			18.2(2) ps	87Sc31
1108.44(4)	2 ⁺	2	32	0.18	9	2	0.09	2	0.31			8.0(15) ps	82Va08
1410.08(5)	4 ⁺	4	26	0.13	9	4	0.06	$\langle 4 \rangle$	0.14			1.8(4) ps	78Mo24
1539.46(6)	3 ⁽⁺⁾												
1911.07(11)	0 ⁺	0	100	1.1	180	0	<0.01					>0.8 ps	82Va08
2019.87(10)	$\langle 4^+ \rangle$		12		5	4	0.04						82Va08
2204.9(4)	$\langle 1, 2^+ \rangle$											0.010(4) ps	
2284.22(24)	$\langle 3 \rangle^-$												
2456(5)													
2478.2(5)	$\langle 1, 2^+ \rangle$												
2503.6(4)	2 ⁺	2	81	0.54	27							0.24(+55-10) ps	79Le07
2554(5)													
2591.10(16)	$\langle 1^+, 2^+ \rangle$												
2624(5)													
2654.51(21)	$\langle \leq 4 \rangle$												
2692.40(8)	3 ⁻	3	303	5.2	58			3	0.59			0.28(+15-8) ps	87Sc31
2733.4(7)	4 ⁺	4	74	0.36	8							0.17(+18-8) ps	79Le07
2747.76(8)	$\langle 1-4 \rangle$											0.33(+33-12) ps	
2768.76(14)	2 ⁺	2	33	0.17	7			2	0.14				87Sc31
2841.57(13)	2 ⁺	2	132	0.86	35							0.028(8) ps	79Le07
2897.7(5)	0 ⁺	0	53	0.51	76								79Le07
2919.79(7)	1									2.1(8)	1.5(6)	0.21(+10-6) ps	95Ju01
2921(5)	3 ⁻							3	0.07				87Sc31
2962.2	$\langle 5 \rangle^-$	5	255	1.2	38			$\langle 5 \rangle$	0.23				87Sc31
2994(5)	4 ⁺	4	293	1.3	72			4	0.31				87Sc31
3007.8(4)	$\langle 1, 2^+ \rangle$											0.026(+28-13) ps	
3014.2(4)	1									2.0(3)	1.6(2)		95Ju01
3041.0(6)	$\langle 2^+ \rangle$				13							0.23(+35-10) ps	
3052.5(7)	$\langle 1-5 \rangle$											0.030(+14-10) ps	
3071(5)													
3088.4(7)										2.1(6)	1.7(5)		95Ju01
3131.8(7)	$\langle \leq 4 \rangle$												
3141.51(7)	2 ⁺				17					4.4(4)	6(2)	0.06(+7-4) ps	95Ju01
3166(5)													
3182.21(6)	$\langle 2^+ \rangle$											0.25(+35-11) ps	
3195(5)	$\langle 4^- - 6^- \rangle$				27								78Mo24
3224(5)													
3231.8(4)	4 ⁺				34			4	0.25				87Sc31
3268(5)	$\langle 4^+ \rangle$							$\langle 4 \rangle$	0.12				87Sc31
3312.33(12)	3 ⁻				9			3	0.10				87Sc31
3317(5)	$\langle 0^+ \rangle$												
3322.85(7)	$\langle 2^+ - 4^+ \rangle$											0.16(+14-6) ps	
3334.7(3)	$\langle 2^+ \rangle$												
3349(5)													

(continued)

⁷⁶Ge
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E^*	J^π	L	σ (t,p)	ε	σ (t,p)	L	S'_α	L	βR	I_s	$\Gamma_{\gamma f}$	$T_{1/2}$ or	Ref.
[keV]		(t,p)	μb	(t,p)	$\mu b/sr$	(d, ⁶ Li)	(d, ⁶ Li)		(α, α')	[eVb]	[meV]	Γ_{cm}	
3391(5)	$\langle 4^+, 5^- \rangle$				8								78Mo24
3409.19(19)	$\langle 1-4 \rangle$												
3419.3(1)	1^+									46(2)	68(3)		95Ju01
3439(5)													
3453(5)	$\langle 3^+-5^+ \rangle$												
3477.65(17)	$\langle 1-4 \rangle$				91								78Mo24
3484.1(9)	3^-							3	0.28				87Sc31
3506(5)													
3533(5)					110								78Mo24
3545(5)	2^+				incl			2	0.12				87Sc31
3585(5)	$\langle 2 \rangle^+$							$\langle 2 \rangle$	0.10				87Sc31
3596.8(4)	2^+									2.8(7)	7.1(13)		95Ju01
3606(5)													
3632.75(10)	$\langle 2^+ \rangle$												
3640(5)	$\langle 4^--6^- \rangle$												
3658(5)					30								78Mo24
3680.7(1)	1^-									59(3)	83(5)		95Ju01
3691(5)													
3721(5)	$\langle 5 \rangle^-$				<14			$\langle 5 \rangle$	0.11				87Sc31
3748(5)	2^+							2	0.10				87Sc31
3763.4(2)	1^+									29(3)	69(6)		95Ju01
3788(5)													
3805(5)					<9								78Mo24
3815(5)													
3848(5)													
3868(5)													
3883(5)													
3887.05(19)	$\langle 3^- \rangle$				91			3	0.26				87Sc31
3951.89(7)	$\langle 1, 2^+ \rangle$												87Sc31
3972(5)	$\langle 4^+ \rangle$							$\langle 4 \rangle$	0.11				87Sc31
3997(5)	4^+							4	0.20				87Sc31
4024.2(3)	$1^{\langle - \rangle}$									3.9(8)	5.5(11)		95Ju01
4026(5)													
4034.8(9)	1									3.8(14)	5.3(20)		95Ju01
4056(5)													
4073(5)													
4099(5)	5^-							5	0.15				87Sc31
4122.3(4)	$\langle 1, 2^+ \rangle$							$\langle 1 \rangle$	0.03				87Sc31
4153(5)													
4192.85(12)	$\langle 2^+-4^+ \rangle$												
4209(5)	3^-							3	0.19				87Sc31
4239.40(15)	$\langle 1-4 \rangle$												
4249(5)	4^+							4	0.13				87Sc31
4272(5)													
4326.5(2)	$\langle 1-4 \rangle$												87Sc31

(continued)

⁷⁶Ge
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E^*	J^π	L	σ (t,p)	ε	σ (t,p)	L	S'_α	L	βR	I_s	$\Gamma_{\gamma f}$	$T_{1/2}$ or	Ref.
[keV]		(t,p)	μb	(t,p)	$\mu b/sr$	(d, ⁶ Li)	(d, ⁶ Li)		(α, α')	[eVb]	[meV]	Γ_{cm}	
4331.3(12)	1									31(6)	50(10)		95Ju01
4363.5(2)	4 ⁺							4	0.14				87Sc31
4399(5)	$\langle 3^+-5^+ \rangle$												
4426(10)													
4444(10)	$\langle 3^+-5^+ \rangle$												
4476.5(2)	$\langle \leq 4 \rangle$												87Sc31
4488(10)	3 ⁻							3	0.16				87Sc31
4536(10)*	$\langle 3^+-5^+ \rangle$												87Sc31
4570(10)													87Sc31
4611(10)	$\langle 3^- \rangle$							$\langle 3 \rangle$	0.19				87Sc31
4623.7(11)	1 ⁺									55(9)	<101		95Ju01
4659(10)	$\langle 5^- \rangle$							$\langle 5 \rangle$	0.23				87Sc31
4698(10)													
4719.9(2)	$\langle 2,3,4 \rangle$												
4736(10)													
4767(10)													
4784.1(3)	$\langle 1-4 \rangle$												
4812.5(2)	$\langle 2^+-4^+ \rangle$												
4814.8(3)	$\langle 1-4 \rangle$												
4839(10)	$\langle 3^+-5^+ \rangle$												
4868(10)													
4917.7(6)	1									53(5)	<111		95Ju01
4939(10)													
5122.48(14)	$\langle 1-4 \rangle$												
5276(10)													
5522.6(2)	$\langle 1-4 \rangle$												
5540.7(5)	1									39(7)	103(18)		95Ju01
5579.0(5)	1									43(9)	478(140)		95Ju01
5626.7(8)	1									49(7)	133(20)		95Ju01
5663.37(15)	$\langle 2^+ \rangle$												
5698.9(7)	1 ⁻									91(8)	256(22)		95Ju01
5748.5(9)	1 ⁻									58(8)	166(24)		95Ju01
5883.0(3)	$\langle 1-4 \rangle$												
5956.5(5)	1									63(7)	194(23)		95Ju01
5983.9(8)	1 ⁻									48(7)	150(20)		95Ju01
6021.1(3)	$\langle 1-4 \rangle$												
6065.2(4)	$\langle 1-4 \rangle$												
6999.0(8)	1 ⁻									65(9)	278(37)		95Ju01
7026.8(5)	1 ⁽⁻⁾									90(9)	386(37)		95Ju01
7251.4(7)	1 ⁻									92(13)	766(154)		95Ju01
7300.8(24)	1 ⁻									126(14)	896(115)		95Ju01
7694.6(11)	1									57(11)	295(54)		95Ju01
7918.6(23)	1 ⁻									133(32)	724(171)		95Ju01
8153.3(10)	1 ⁽⁻⁾									123(12)	708(71)		95Ju01
8425.8(12)	1									46(7)	286(45)		95Ju01

(continued)

⁷⁶₃₂Ge

E^*	J^π	L	σ (t,p)	ε	σ (t,p)	L	S'_α	L	βR	I_s	$\Gamma_{\gamma f}$	$T_{1/2}$ or	Ref.
[keV]		(t,p)	μb	(t,p)	$\mu b/sr$	(d, ⁶ Li)	(d, ⁶ Li)		(α, α')	[eVb]	[meV]	Γ_{cm}	
8546.8(25)	1 ⁻									120(14)	762(87)		95Ju01
8748.4(31)	1 ⁻									123(13)	2250(360)		95Ju01
9013.2(19)	1 ⁻									101(12)	709(83)		95Ju01
			79Le07	79Le07		82Va08	82Va08		87Sc31	95Ju01	95Ju01		Ref.
					78Mo24								Ref.

Additional data on this isotope can be found in [02To0A, 89Ca02, 84Ca30, 78Ar17].

Abundance: 7.83(7) %.

* Multiplet.

Parameter of the (d,⁶Li) reaction $S'_\alpha = (2J+1)\sigma_{exp}/\sigma_{DWBA}$ was measured in the angular range from 0° to 30° at the energy 45 MeV; transferred α particle is treated as a $J=0$ cluster [82Va08].

Energy levels and branching ratios [84Si14, 95Si03]. Part 2

⁷⁶₃₂Ge

E^*	J^π	Branching ratios in percentage										
		E_f^* :	0.0	562.9	1108	1410	1539	1911	2020	2284	2654.51	2692.40
[keV]		J_f^π :	0 ⁺	2 ⁺	2 ⁺	4 ⁺	3 ⁽⁺⁾	0 ⁺	$\langle 4^+ \rangle$	$\langle 3^- \rangle$	$\langle \leq 4 \rangle$	3 ⁻
562.93(3)	2 ⁺		100									
1108.44(4)	2 ⁺		40(4)	60(1)								
1410.08(5)	4 ⁺			100								
1539.46(6)	3 ⁽⁺⁾			33(1)	67(5)							
1911.07(11)	0 ⁺			100								
2019.87(10)	$\langle 4^+ \rangle$				100							
2204.9(4)	$\langle 1, 2^+ \rangle$	x			x							
2284.22(24)	$\langle 3^- \rangle$				100							
2478.2(5)	$\langle 1, 2^+ \rangle$	x	x									
2503.6(4)	2 ⁺	30			70							
2591.10(16)	$\langle 1^+, 2^+ \rangle$	22(4)			40(6)		38(6)					
2654.51(21)	$\langle \leq 4 \rangle$			30(7)	70(14)							
2692.40(8)	3 ⁻	6(2)		86(3)	8(3)	<11						
2733.4(7)	4 ⁺						x					
2747.76(8)	$\langle 1-4 \rangle$			7(1)	73(2)		20(1)					
2768.76(14)	2 ⁺				81(6)	19(6)						
2841.57(13)	2 ⁺			38(3)	62(6)							
2897.7(5)	0 ⁺			100								
2919.79(7)	1	73(3)	20(1)	6.8(4)								
3007.8(4)	$\langle 1, 2^+ \rangle$	50			50							
3041.0(6)	$\langle 2^+ \rangle$		x					x				
3052.5(7)	$\langle 1-5 \rangle$						100					
3131.8(7)	$\langle \leq 4 \rangle$				100							
3141.51(7)	2 ⁺	65(3)	35(1)					x				
3182.21(6)	$\langle 2^+ \rangle$			30(1)	57(2)		13(1)					

(continued)

⁷⁶₃₂Ge

E^* [keV]	J^π	Branching ratios in percentage										
		E_f^* : J_f^π :	0.0 0 ⁺	562.9 2 ⁺	1108 2 ⁺	1410 4 ⁺	1539 3 ⁽⁺⁾	1911 0 ⁺	2020 <4 ⁺ >	2284 <3> ⁻	2654.51 <≤4>	2692.40 3 ⁻
3231.8(4)	4 ⁺			100								
3312.33(12)	3 ⁻				76(6)	24(2)						
3322.85(7)	<2 ⁺ -4 ⁺ >			28(2)	57(2)	15(1)						
3334.7(3)	<2 ⁺ >	49(11)				51(7)						
3419.3(1)	1 ⁺	100										
3477.65(17)	<1-4>			12(2)	4(2)							
3484.1(9)	3 ⁻			x		x						
3632.75(10)	<2 ⁺ >			40(2)	34(2)			6(2)	20(3)			
3887.05(19)	<3 ⁻ >			7(4)	51(5)	14(3)	28(3)					
3951.89(7)	<1,2 ⁺ >	45(4)		30(2)	17(1)			4(1)				3(1)
4122.3(4)	<1,2 ⁺ >	30(4)		70(6)								
4192.85(12)	<2 ⁺ -4 ⁺ >					46(4)						
4239.40(15)	<1-4>				19(4)							
4326.5(2)	<1-4>											76(4)
4476.5(2)	<≤4>			10(3)								
4719.9(2)	<2,3,4>									37(5)		
4784.1(3)	<1-4>				57(6)							
4812.5(2)	<2 ⁺ -4 ⁺ >					25(4)						
5522.6(2)	<1-4>										52(7)	
5663.37(15)	<2 ⁺ >					23(4)		17(4)				40(5)
5748.5(9)	1 ⁻									40(8)		
5883.0(3)	<1-4>											52(7)
6021.1(3)	<1-4>									32(8)	29(6)	40(12)

Energy levels and branching ratios [84Si14, 95Si03]. Part 3

⁷⁶₃₂Ge

E^* [keV]	J^π	Branching ratios in percentage									
		E_f^* : J_f^π :	2747.76 <1-4>	2768.76 2 ⁺	2841.57 2 ⁺	2919.79 <1,2 ⁺ >	3141.51 2 ⁺	3182.21 <2 ⁺ >	3312.33 3 ⁻	3322.85	3409.19 <1-4>
3409.19(19)	<1-4>	100									
3477.65(17)	<1-4>						84(21)				
4192.85(12)	<2 ⁺ -4 ⁺ >					54(3)					
4239.40(15)	<1-4>								81(5)		
4326.5(2)	<1-4>								24(4)		
4363.5(2)	4 ⁺					17(4)					
4719.9(2)	<2,3,4>				36(4)						27(5)
4784.1(3)	<1-4>									43(9)	
4812.5(2)	<2 ⁺ -4 ⁺ >					75(5)					
4814.8(3)	<1-4>								49(7)		
5122.48(14)	<1-4>						19(4)	60(4)			
5522.6(2)	<1-4>				48(5)						
5663.37(15)	<2 ⁺ >							20(4)			

(continued)

⁷⁶₃₂Ge

E^*	J^π	Branching ratios in percentage								
[keV]		E_f^* : J_f^π :	2747.76 ⟨1-4⟩	2768.76 2 ⁺	2841.57 2 ⁺	2919.79 ⟨1,2 ⁺ ⟩	3141.51 2 ⁺	3182.21 ⟨2 ⁺ ⟩	3312.33 3 ⁻	3322.85 3409.19 ⟨1-4⟩
5748.5(9)	1 ⁻			60(12)						
5883.0(3)	⟨1-4⟩							48(8)		
6065.2(4)	⟨1-4⟩				68(14)			32(11)		

Energy levels and branching ratios [84Si14, 95Si03]. Part 4

⁷⁶₃₂Ge

E^*	J^π	Branching ratios in percentage		
[keV]		E_f^* : J_f^π :	3477.65 ⟨1-4⟩	3632.75 ⟨2 ⁺ ⟩ 4239.40 ⟨1-4⟩
4363.5(2)	4 ⁺		83(7)	
4476.5(2)	⟨≤4⟩			90(9)
4814.8(3)	⟨1-4⟩			51(8)
5122.48(14)	⟨1-4⟩			20(6)
5522.6(2)	⟨1-4⟩			<42

Energy levels and branching ratios [97Fa12].

⁷⁷₃₂Ge

E^*	$2J^\pi$	L	S'	σ (d,p)	S'	σ (d,p)	σ (d,p)	$T_{1/2}$ or	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
0.0	7 ⁺			10				11.30(1) h	
159.70(10)	1 ⁻	1	0.58	470		0.52	1000	52.9(6) s	76Yo04
224.9(7)	9 ⁺	4	3.0	190		2.16	600		72Ha74
421.0(7)	3 ⁺ ,5 ⁺	2	0.026			0.026	91		76Yo04
491.9(10)									
504.8(6)	5 ⁺	2	0.56	450		0.43	1240		76Yo04
581.0(8)	1,3,5 ⁻								
618.8(7)	1,3,5 ⁻								
629.4(8)	3 ⁻	1	0.20	240		0.19	1130		76Yo04
760.5(6)	5 ⁺ ,7,9 ⁺								
778.0(7)	1,3,5 ⁻								
884.3(10)	5 ⁺	2	0.21	200		0.17	670		76Yo04
1021.1(7)	1,3,5 ⁻			240		0.16	380		73Ka03
1047.6(10)	1 ⁻ ,3 ⁻	1	0.02			0.02	130		76Yo04
1109(10)									
1189(10)	⟨7 ⁺ ,9 ⁺ ⟩	4	0.058			0.058	21		76Yo04
1250.4(10)	1 ⁺	0	0.48	1570					76Yo04
1358.7(12)				900					73Ka03
1385.0(6)	5 ⁺	2	0.39			0.73	1200		76Yo04

(continued)

⁷⁷₃₂Ge

E^*	$2J^\pi$	L	S'	σ (d,p)	S'	σ (d,p)	σ (d,p)	$T_{1/2}$ or	Ref.
[keV]			(d,p)	$\mu\text{b/sr}$	(d,p)	$\mu\text{b/sr}$	$\mu\text{b/sr}$	Γ_{cm}	
1536(10)	1^+	0	0.12	170		0.033	620		76Yo04
1610(10)									
1663.3(8)	$\langle 1,3,5^- \rangle$								
1777(10)	1^+	0	0.15	300		0.037	700		76Yo04
1804(10)	3^+	2	0.68	370		0.24	1070		76Yo04
1823.3(13)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.22	450					73Ka03
1883(10)				30					73Ka03
1954(10)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.04	60					73Ka03
2060(10)				50					73Ka03
2088(10)	$\langle 7^+, 9^+ \rangle$	4	0.32	30		0.32	130		76Yo04
2120(10)	$\langle 3^+, 5^+ \rangle$	2	0.059	100		0.059	290		76Yo04
2260(10)									
2305(10)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.15	190					73Ka03
2442(10)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.13	150					76Yo04
2479(10)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.04	100					76Yo04
2515(10)				40					73Ka03
2556(10)				40					73Ka03
2783(10)				50					73Ka03
2816.7(13)									
2873(10)	$\langle 1^+ \rangle$	0	0.16	510					76Yo04
2929(10)				50					73Ka03
2960(10)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.08	150					73Ka03
2998(10)				30					73Ka03
3090(15)				70					73Ka03
3135(10)				160					73Ka03
3147(10)				incl					
3242(10)	$\langle 3^+, 5^+ \rangle$	2	0.51	600					73Ka03
3257(10)	$\langle 1^+ \rangle$	$\langle 0 \rangle$	0.22	440					73Ka03
3364(15)	$\langle 3^+, 5^+ \rangle$	$\langle 2 \rangle$	0.36	520					76Yo04
3388(15)				80					73Ka03
3443(15)				100					73Ka03
3496(15)				70					73Ka03
3547(15)				70					73Ka03
			76Yo04	73Ka03		72Ha74	72Ha74		Ref.

Values $(2J+1)S$ for deuteron stripping (d,p) reaction are adopted in [97Fa12] from [76Yo04, 73Ka03]; cross sections σ (d,p) are from [73Ka03].

Comparison of energy levels observed in the (n, γ) reaction with the levels from the (d,p) reaction was performed in [72Ha74].

Energy levels and branching ratios [97Fa12]. Part 2

⁷⁷₃₂Ge

E^* [keV]	$2J^\pi$	Branching ratios in percentage											
		$E_f^*:$ $2J_f^\pi:$	0.0 7 ⁺	159.7 1 ⁻	225 9 ⁺	421 3 ⁺ ,5 ⁺	505 5 ⁺	581.0 1,3,5 ⁻	618.8 1,3,5 ⁻	629.4 3 ⁻	760.5 5 ⁺ ,7,9 ⁺	778.0 1,3,5 ⁻	1021.1 1,3,5 ⁻
159.70(10)	1 ⁻		x										
224.9(7)	9 ⁺		x										
421.0(7)	3 ⁺ ,5 ⁺		x										
491.9(10)			x										
504.8(6)	5 ⁺		x		x	x							
581.0(8)	1,3,5 ⁻			x									
618.8(7)	1,3,5 ⁻			x									
629.4(8)	3 ⁻			x									
760.5(6)	5 ⁺ ,7,9 ⁺		x		x		x						
778.0(7)	1,3,5 ⁻			x				x					
884.3(10)	5 ⁺		x										
1021.1(7)	1,3,5 ⁻			x					x				
1047.6(10)	1 ⁻ ,3 ⁻			x									
1358.7(12)									x				
1385.0(6)	5 ⁺		x			x	x		x	x	x		
1663.3(8)	⟨1,3,5 ⁻ ⟩			x									x
1823.3(13)	⟨1 ⁺ ⟩							x					
2816.7(13)										x			

Energy levels and branching ratios [91Ra06].

⁷⁸₃₂Ge

E^*	J^π	L	S'_α	L	σ (t,p)	ε	σ (t,p)	$T_{1/2}$ or	Ref.	Branching ratios in percentage					
[keV]			(d, ^6Li)	(t,p)	$\mu\text{b/sr}$	(t,p)	$\mu\text{b/sr}$	Γ_{cm}		E^*_f :	0.0	619	1186	1547	1570
										J^π_f :	0^+	$\langle 2^+ \rangle$	$\langle 2^+ \rangle$	0^+	$\langle 4^+ \rangle$
0.0	0^+	0	0.36	0	905	28	4170	88(1) m	82Va08						
619.34(13)	$\langle 2^+ \rangle$	2	0.26	2	54	1.5			82Va08	100					
1186.5(1)	$\langle 2^+ \rangle$	2	0.15	2	8.7	0.24			82Va08	52(3)	48(3)				
1546.6(4)	0^+		<0.01	0	30	0.09	168		84Mo07		100				
1570.1(2)	$\langle 4^+ \rangle$	4	0.07	4		0.11			82Va08		100				
1644.5(2)	$\langle 2,3,4^+ \rangle$										68(4)	32(2)			
1842.7(2)	$\langle 2^+ \rangle$			2	16.1	0.38			78Ar12		100				
2292(3)	$\langle 4^+ \rangle$			$\langle 4 \rangle$	14.3	0.45			78Ar12						
2319.3(2)															
2330(3)				$\langle 4,5 \rangle$	25	≈ 0.8	39		78Ar12						
2404(5)															
2438.7(2)	$\langle 2^+ \rangle$			2	56.9	1.5			78Ar12		56(9)	37(5)	7(4)		
2652(3)	$\langle 5^- \rangle$			5	29.7	1.0			78Ar12						
2665.7(2)	$\langle 2,3,4^+ \rangle$										27(3)	41(3)			
2705.9(2)	$\langle 2^+ \rangle$									52(6)		24(4)			
2759(10)	$3^-, 4^+$			$\langle 3,4 \rangle$	9.7	1,0.3			78Ar12						
2850(10)	$\langle 5^- \rangle$			5	9.2	0.31			78Ar12						
2857.1(2)	$\langle 2,3,4^+ \rangle$										26(5)	34(4)			

(continued)

⁷⁸Ge
₃₂

E^*	J^π	L	S'_α	L	σ (t,p)	ε	σ (t,p)	$T_{1/2}$ or	Ref.	Branching ratios in percentage				
[keV]			(d, ⁶ Li)	(t,p)	$\mu\text{b/sr}$	(t,p)	$\mu\text{b/sr}$	Γ_{cm}		E_f^* : 0.0	619	1186	1547	1570
										J_f^π : 0 ⁺	$\langle 2^+ \rangle$	$\langle 2^+ \rangle$	0 ⁺	$\langle 4^+ \rangle$
2952.8(3)	$\langle 4^+ \rangle$			4					78Ma21		63(11)			25(22)
3120.6(3)	$\langle 2,3,4^+ \rangle$										19(4)	70(5)		
3183(10)	$\langle 2^+ \rangle$			2					78Ar12					
3236(10)	$\langle 1,3 \rangle^-$			1+3					78Ar12					
3287(10)	$\langle 6^+ \rangle$			0					78Ar12					
3350(10)	0 ⁺			0			224		78Ar12					
3389.8(2)	$\langle 2^+,3,4^+ \rangle$										43(10)			25(10)
3615(10)	$\langle 3^- \rangle$			3					78Ma21					
3638(10)	$\langle 2^+ \rangle$			2					78Ma21					
3667(10)	0 ⁺			0			348		78Ar12					
3687.8(3)	$\langle 4^+ \rangle$			4					78Ma21			32(16)		
3797(10)	$\langle 3^- \rangle$			3					78Ma21					
3816(10)	$\langle 2^+ \rangle$			2					78Ma21					
3898(10)	0 ⁺			0			134		78Ma21					
3965(10)	$\langle 2^+ \rangle$			2					78Ar12					
4015(10)	$\langle 0^+ \rangle$			0			359		78Ma21					
4036(10)	$\langle 5^- \rangle$			5					78Ar12					
4070(10)	$\langle 2^+ \rangle$			2					78Ma21					
4083.7(5)	$\langle 2,3,4^+ \rangle$										73(9)			
4115(10)	$\langle 1^- \rangle$			1					78Ar12					
4134(10)	$\langle 2^+ \rangle$			2					78Ma21					
4270.1(2)	$\langle 2,3,4^+ \rangle$											12(8)		
4279.4(4)	$\langle 2,3,4^+ \rangle$											63(11)		
4305(10)														
4335(10)														
4378(10)														
4745(10)														
4816(10)														
5078.2(10)	$\langle 2,3,4^+ \rangle$										93(17)			7(5)
5191(10)														
5324(10)														
		82Va08			78Ar12	78Ar12			Ref.					
							84Mo07		Ref.					

Additional data on this isotope can be found in [84Ca30, 78Ma21].

Parameter of the (d,⁶Li) reaction $S'_\alpha=(2J+1)\sigma_{exp}/\sigma_{DWBA}$ was measured in the angular range from 0° to 30° at the energy 45 MeV [82Va08].

Energy levels and branching ratios [91Ra06]. Part 2

⁷⁸Ge
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E^* [keV]	J^π	Branching ratios in percentage						
		$E_f^*:$ $J_f^\pi:$	1644.5	1842.7 $\langle 2^+ \rangle$	2319.3	2665.7	2705.9 $\langle 2^+ \rangle$	2857.1 3120.6
2319.3(2)			100					
2665.7(2)	$\langle 2,3,4^+ \rangle$		6(2)		26(4)			
2705.9(2)	$\langle 2^+ \rangle$		10(3)	13(6)				
2857.1(2)	$\langle 2,3,4^+ \rangle$		41(5)					
2952.8(3)	$\langle 4^+ \rangle$		13(6)					
3120.6(3)	$\langle 2,3,4^+ \rangle$		11(4)					
3389.8(2)	$\langle 2^+,3,4^+ \rangle$		24(6)					8(2)
3687.8(3)	$\langle 4^+ \rangle$		68(12)					
4083.7(5)	$\langle 2,3,4^+ \rangle$			14(4)				13(7)
4270.1(2)	$\langle 2,3,4^+ \rangle$					50(7)	38(6)	
4279.4(4)	$\langle 2,3,4^+ \rangle$						37(7)	