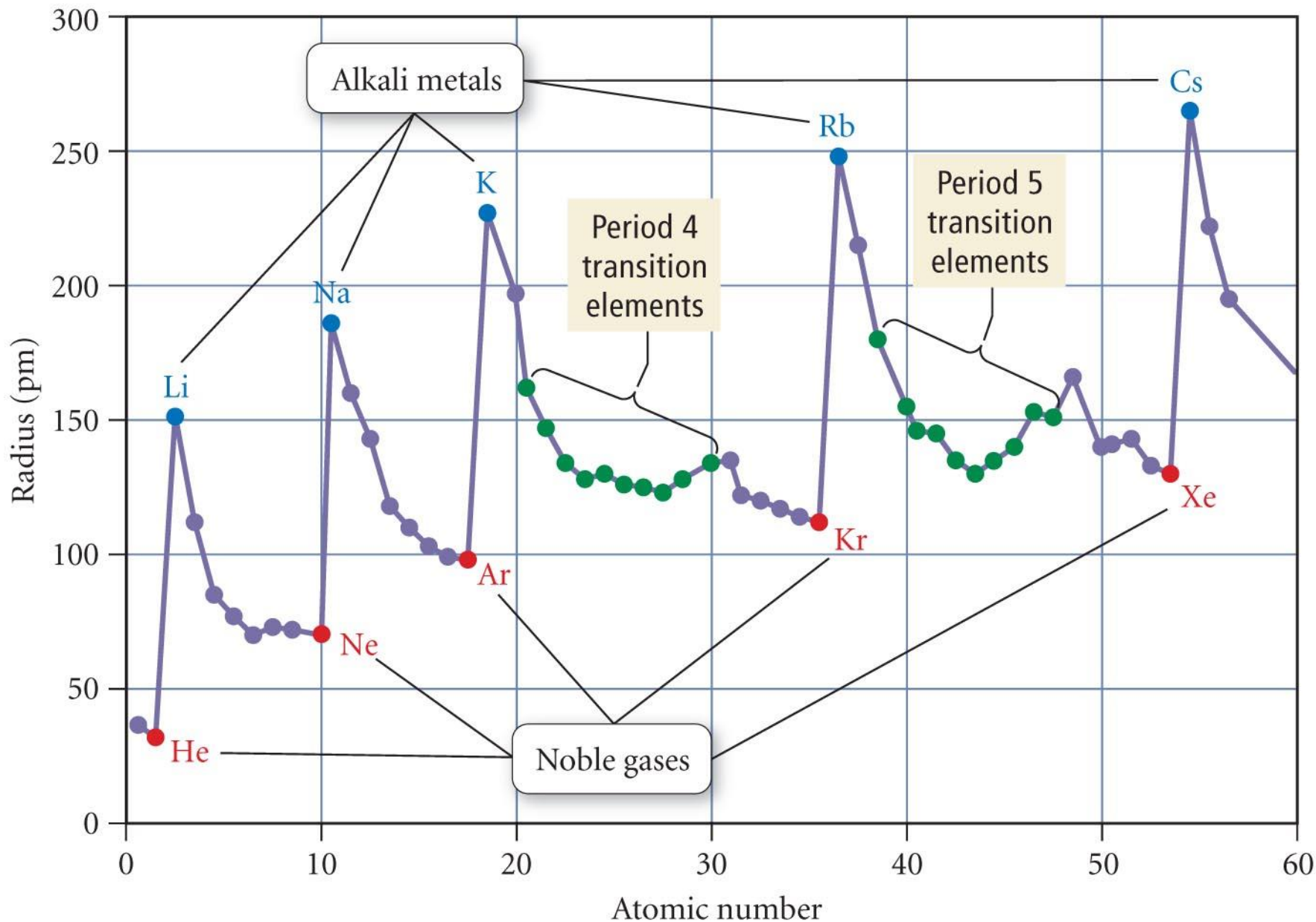


Atomic Radii



Radii of Atoms and Their Cations (pm)

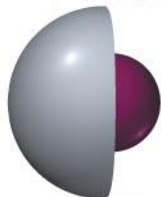
Group 1A

Li Li^+



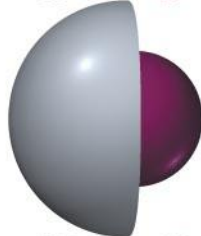
152 60

Na Na^+



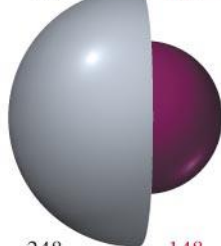
186 95

K K^+



227 133

Rb Rb^+



248 148

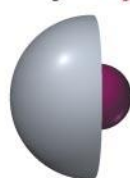
Group 2A

Be Be^{2+}



112 31

Mg Mg^{2+}



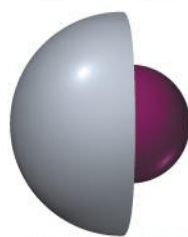
160 65

Ca Ca^{2+}



197 99

Sr Sr^{2+}



215 113

Group 3A

B B^{3+}



85 23

Al Al^{3+}



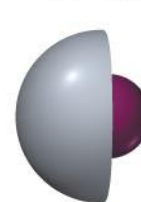
143 50

Ga Ga^{3+}



135 62

In In^{3+}



166 81

Radii of Atoms and Their Anions (pm)

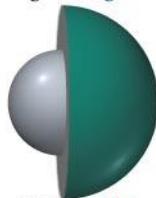
Group 6A

O O^{2-}



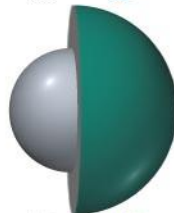
73 140

S S^{2-}



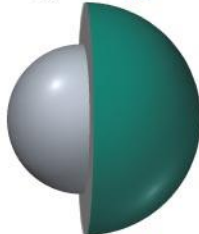
103 184

Se Se^{2-}



117 198

Te Te^{2-}



143 221

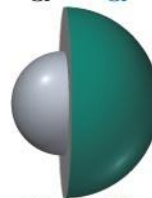
Group 7A

F F^{-}



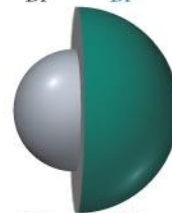
72 136

Cl Cl^{-}



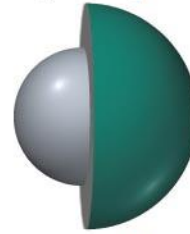
99 181

Br Br^{-}



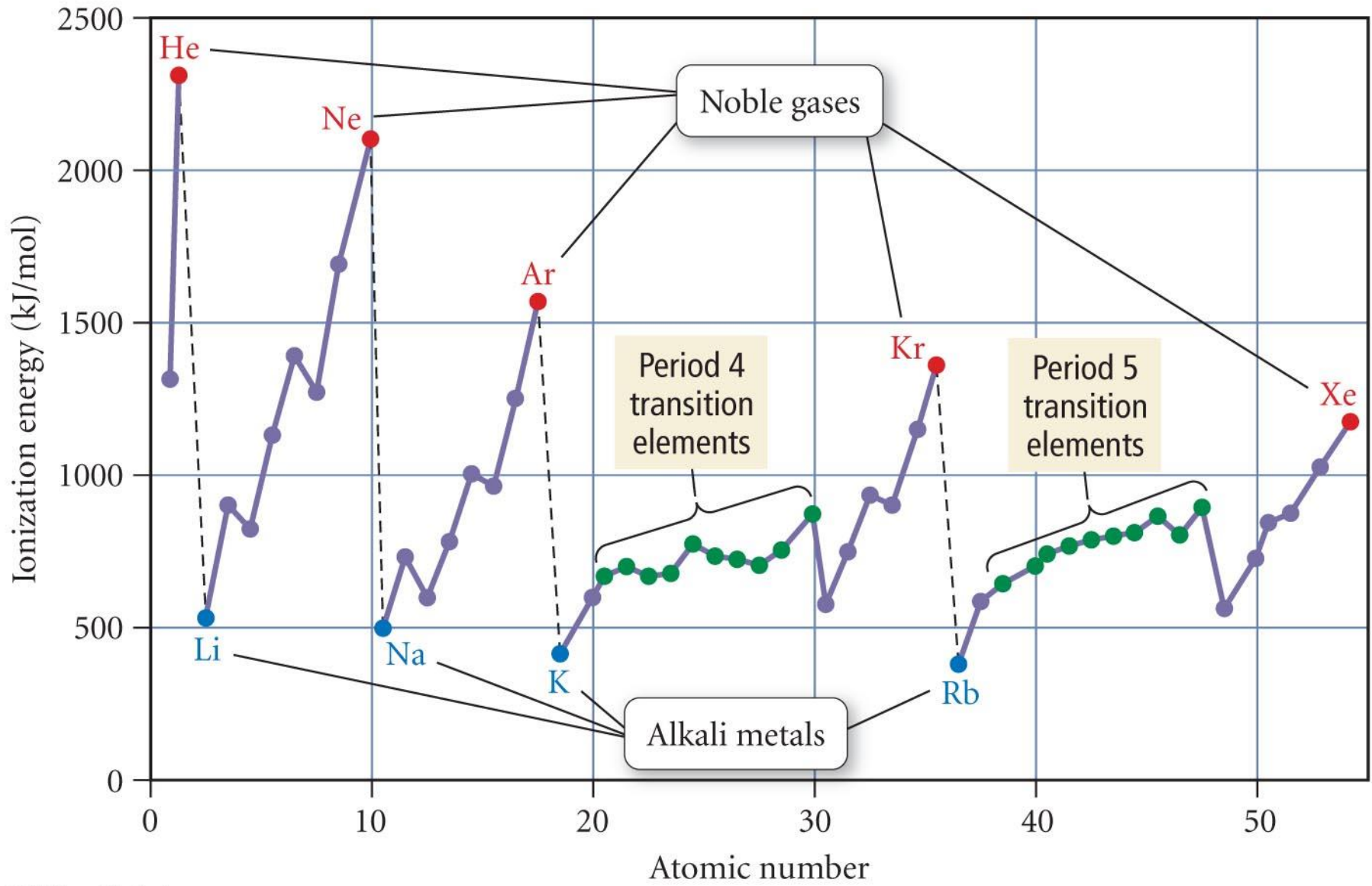
114 195

I I^{-}



133 216

First Ionization Energies



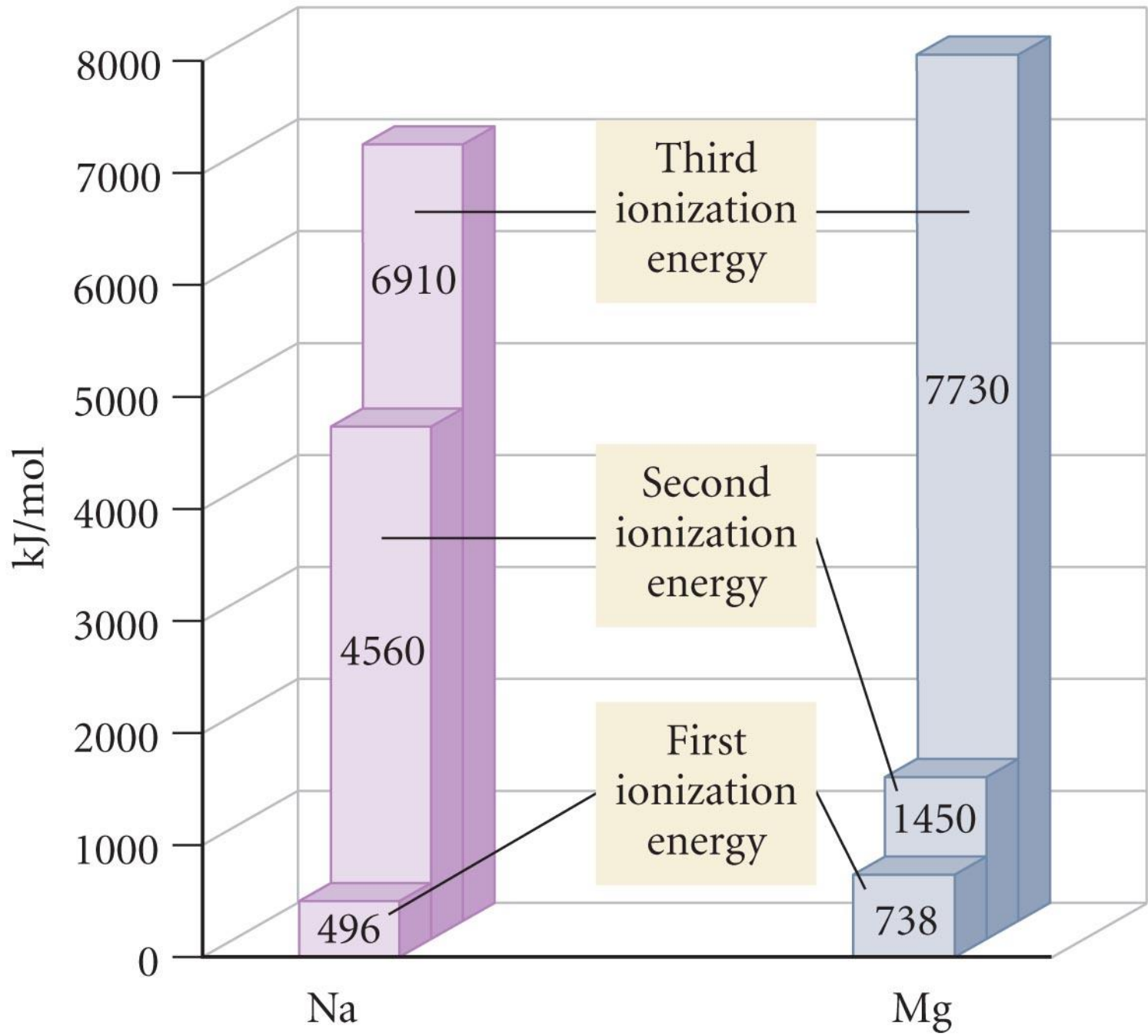


TABLE 8.1 Successive Values of Ionization Energies for the Elements Sodium through Argon (kJ/mol)

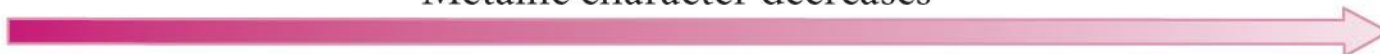
Element	IE ₁	IE ₂	IE ₃	IE ₄	IE ₅	IE ₆	IE ₇
Na	496	4560					
Mg	738	1450	7730				
Al	578	1820	2750	11,600			
Si	786	1580	3230	4360	16,100		
P	1012	1900	2910	4960	6270	22,200	
S	1000	2250	3360	4560	7010	8500	27,100
Cl	1251	2300	3820	5160	6540	9460	11,000
Ar	1521	2670	3930	5770	7240	8780	12,000

Electron Affinities (kJ/mol)

1A								8A
H -73								He >0
	2A	3A	4A	5A	6A	7A		
Li -60	Be >0	B -27	C -122	N >0	O -141	F -328	Ne >0	
Na -53	Mg >0	Al -43	Si -134	P -72	S -200	Cl -349	Ar >0	
K -48	Ca -2	Ga -30	Ge -119	As -78	Se -195	Br -325	Kr >0	
Rb -47	Sr -5	In -30	Sn -107	Sb -103	Te -190	I -295	Xe >0	

Trends in Metallic Character

Metallic character decreases



Metals Metalloids Nonmetals

Periods

1A 1	2A 2																			8A 18	
1 H																					He
2 Li	4 Be																				Ne
3 Na	12 Mg	3B 3	4B 4	5B 5	6B 6	7B 7	8B 8	8B 9	8B 10	1B 11	2B 12	3A 13	4A 14	5A 15	6A 16	7A 17				Ar	
4 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr				
5 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe				
6 Cs	56 Ba	57 La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn				
7 Fr	88 Ra	89 Ac	104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg											

Metallic character increases

Lanthanides

58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
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Actinides

90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr
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