

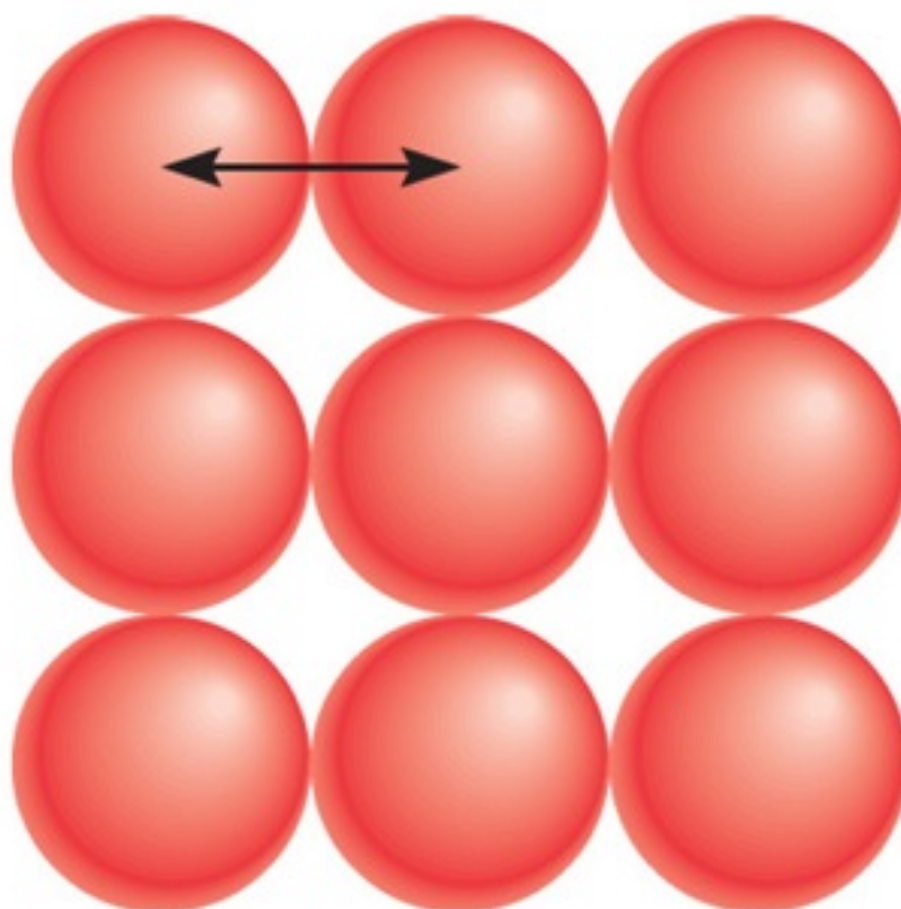
Table 8.2 The Ionization Energies (kJ/mol) of the First 20 Elements

Z	Element	First	Second	Third	Fourth	Fifth	Sixth
1	H	1,312					
2	He	2,373	5,251				
3	Li	520	7,300	11,815			
4	Be	899	1,757	14,850	21,005		
5	B	801	2,430	3,660	25,000	32,820	
6	C	1,086	2,350	4,620	6,220	38,000	47,261
7	N	1,400	2,860	4,580	7,500	9,400	53,000
8	O	1,314	3,390	5,300	7,470	11,000	13,000
9	F	1,680	3,370	6,050	8,400	11,000	15,200
10	Ne	2,080	3,950	6,120	9,370	12,200	15,000
11	Na	495.9	4,560	6,900	9,540	13,400	16,600
12	Mg	738.1	1,450	7,730	10,500	13,600	18,000
13	Al	577.9	1,820	2,750	11,600	14,800	18,400
14	Si	786.3	1,580	3,230	4,360	16,000	20,000
15	P	1,012	1,904	2,910	4,960	6,240	21,000
16	S	999.5	2,250	3,360	4,660	6,990	8,500
17	Cl	1,251	2,297	3,820	5,160	6,540	9,300
18	Ar	1,521	2,666	3,900	5,770	7,240	8,800
19	K	418.7	3,052	4,410	5,900	8,000	9,600
20	Ca	589.5	1,145	4,900	6,500	8,100	11,000

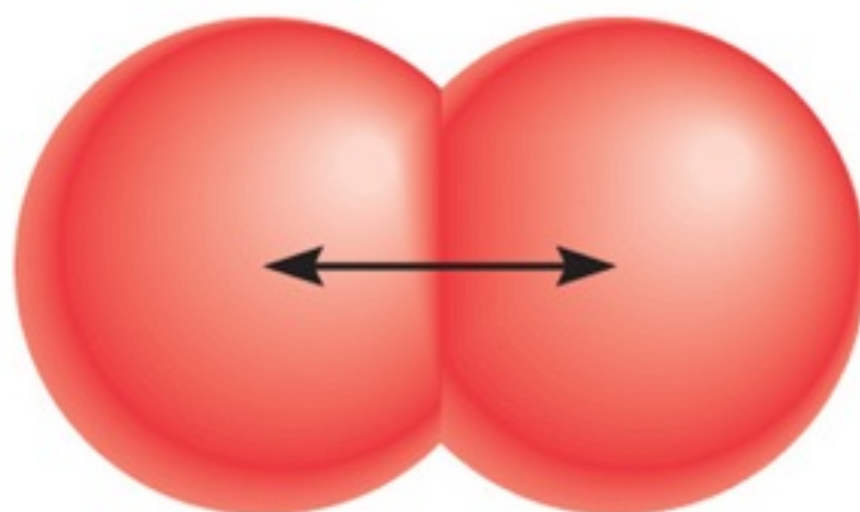
Table 8.3 Electron Affinities (kJ/mol) of Some Representative Elements and the Noble Gases*

1A	2A	3A	4A	5A	6A	7A	8A
H							He
73							<0
Li	Be	B	C	N	O	F	Ne
60	≤0	27	122	0	141	328	<0
Na	Mg	Al	Si	P	S	Cl	Ar
53	≤0	44	134	72	200	349	<0
K	Ca	Ga	Ge	As	Se	Br	Kr
48	2.4	29	118	77	195	325	<0
Rb	Sr	In	Sn	Sb	Te	I	Xe
47	4.7	29	121	101	190	295	<0
Cs	Ba	Tl	Pb	Bi	Po	At	Rn
45	14	30	110	110	?	?	<0

*The electron affinities of the noble gases, Be, and Mg have not been determined experimentally, but are believed to be close to zero or negative.

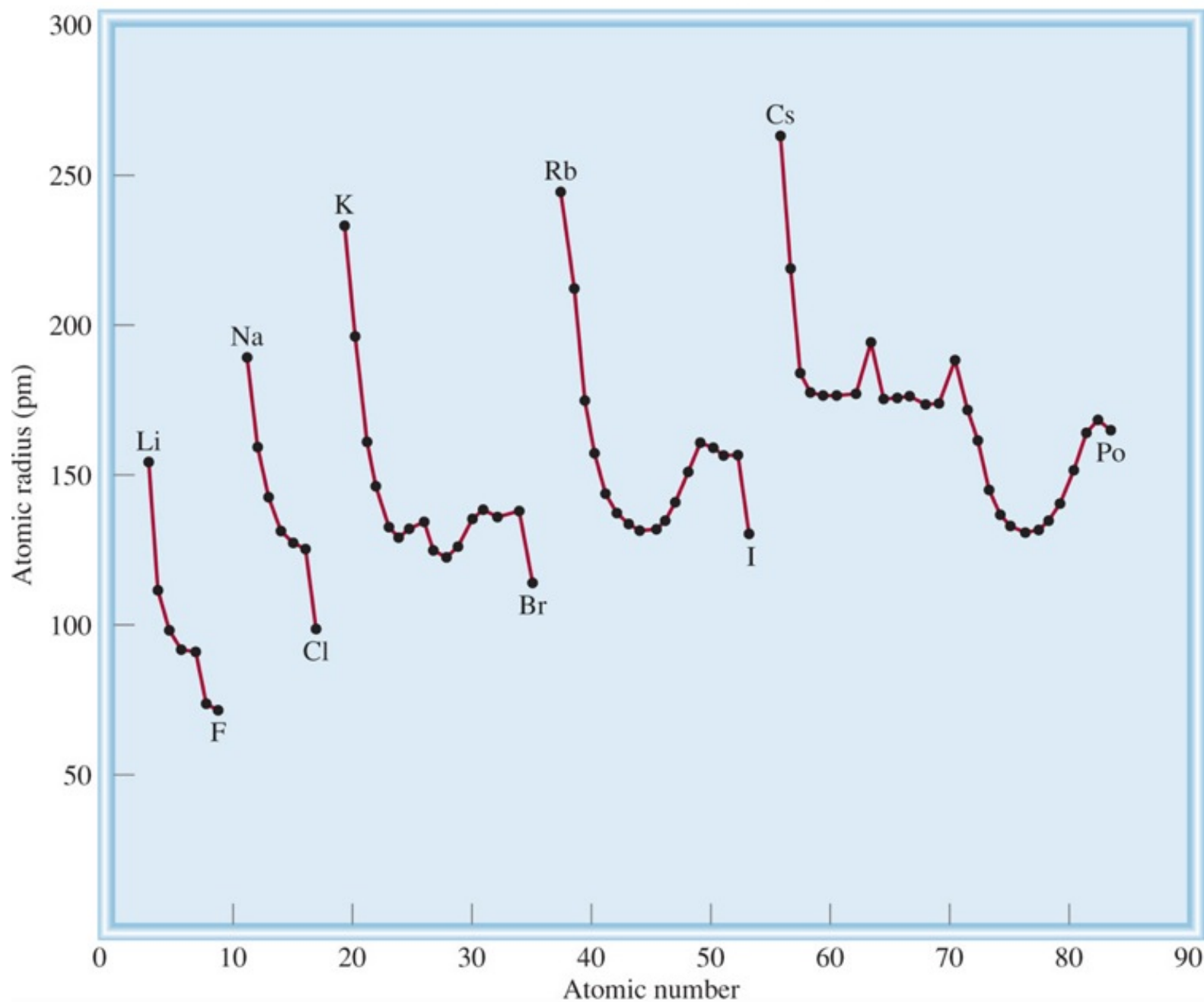


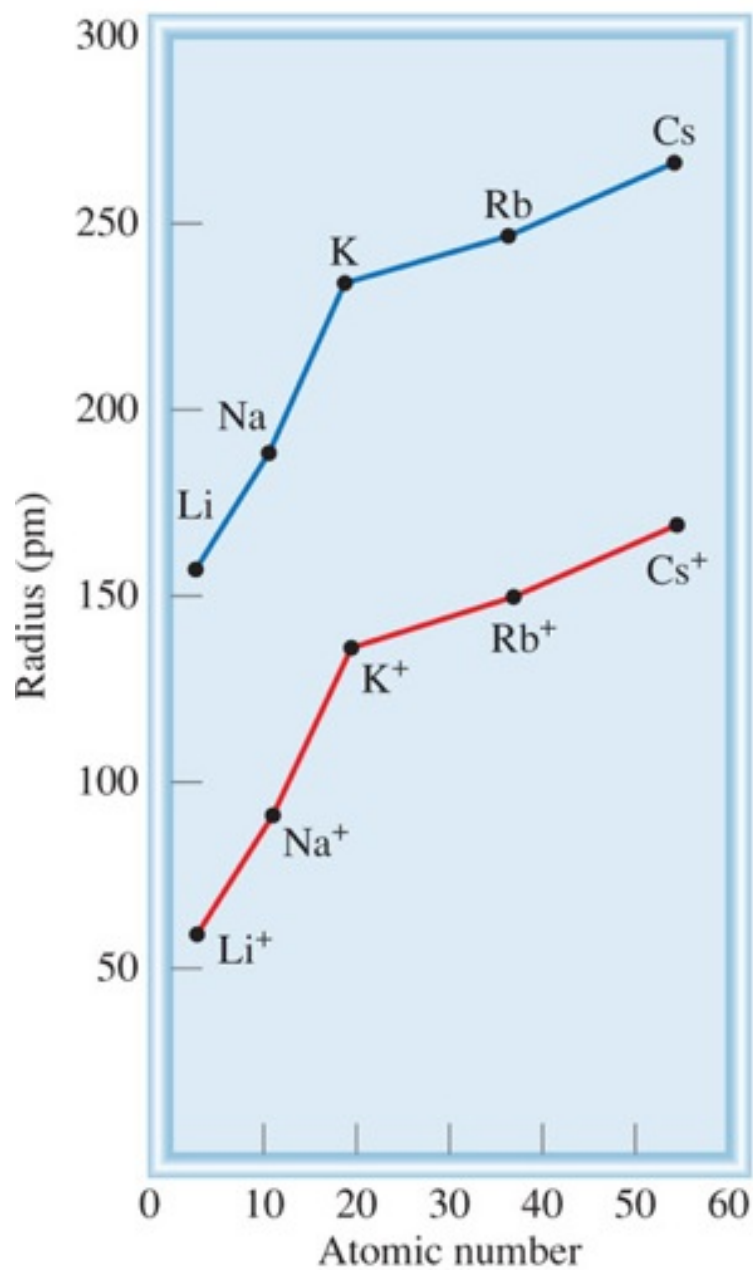
(a)



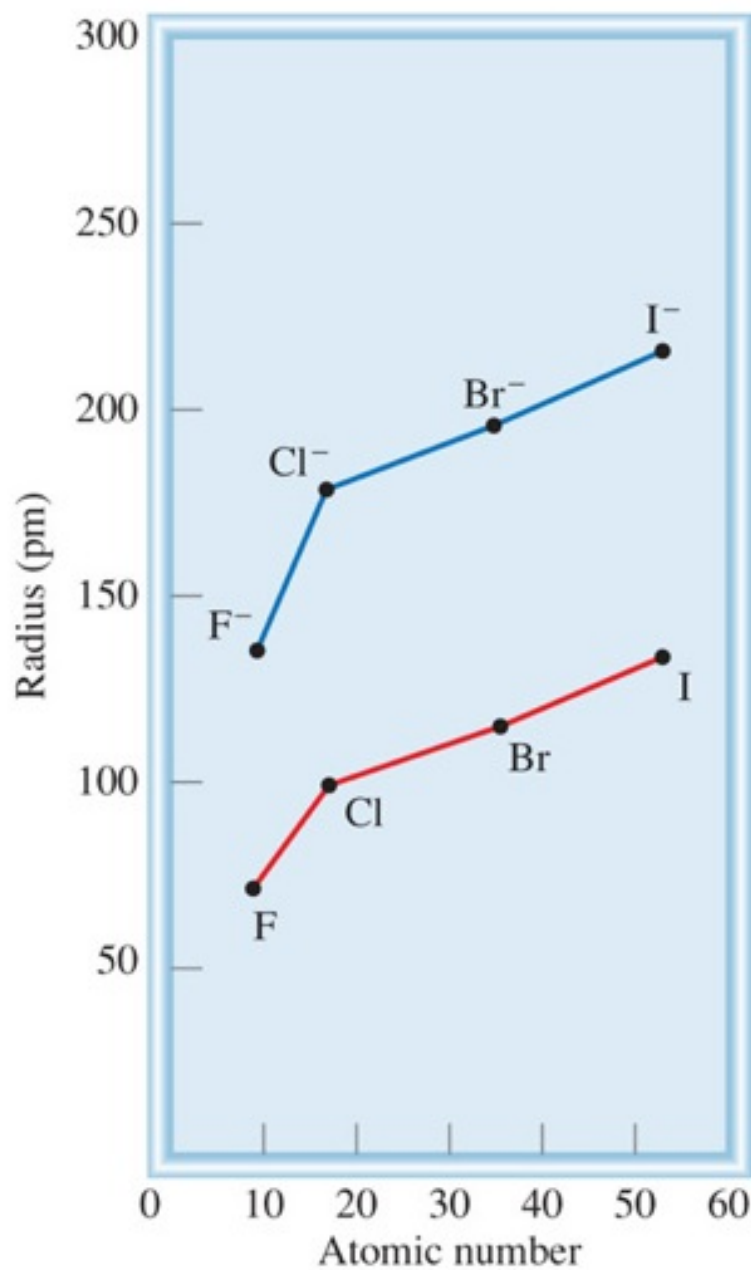
(b)





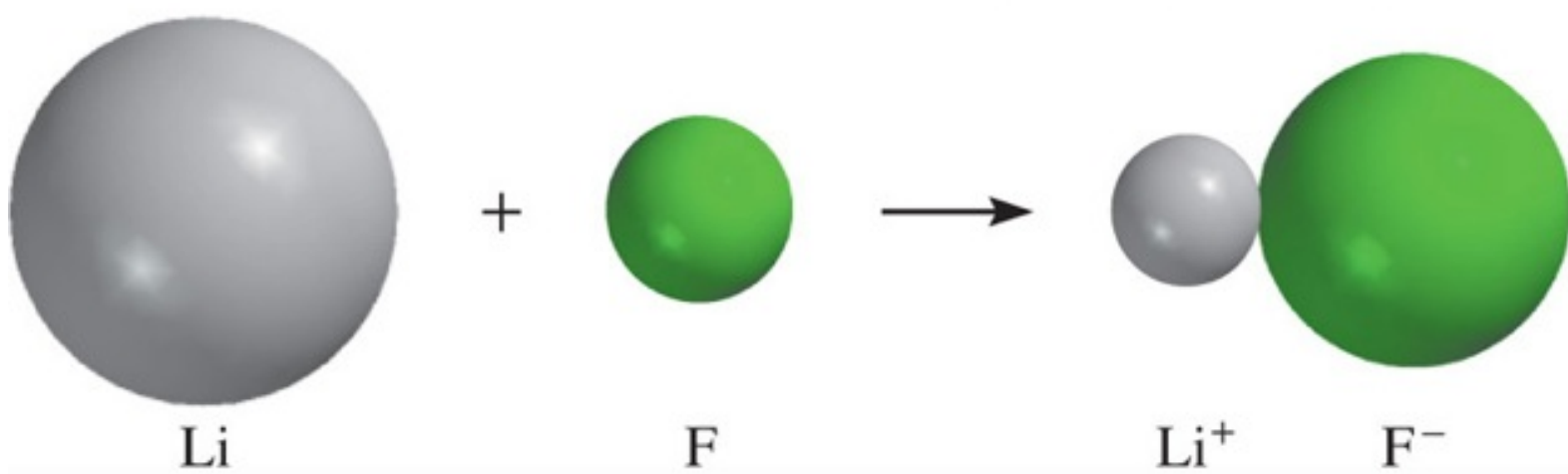


(a)



(b)

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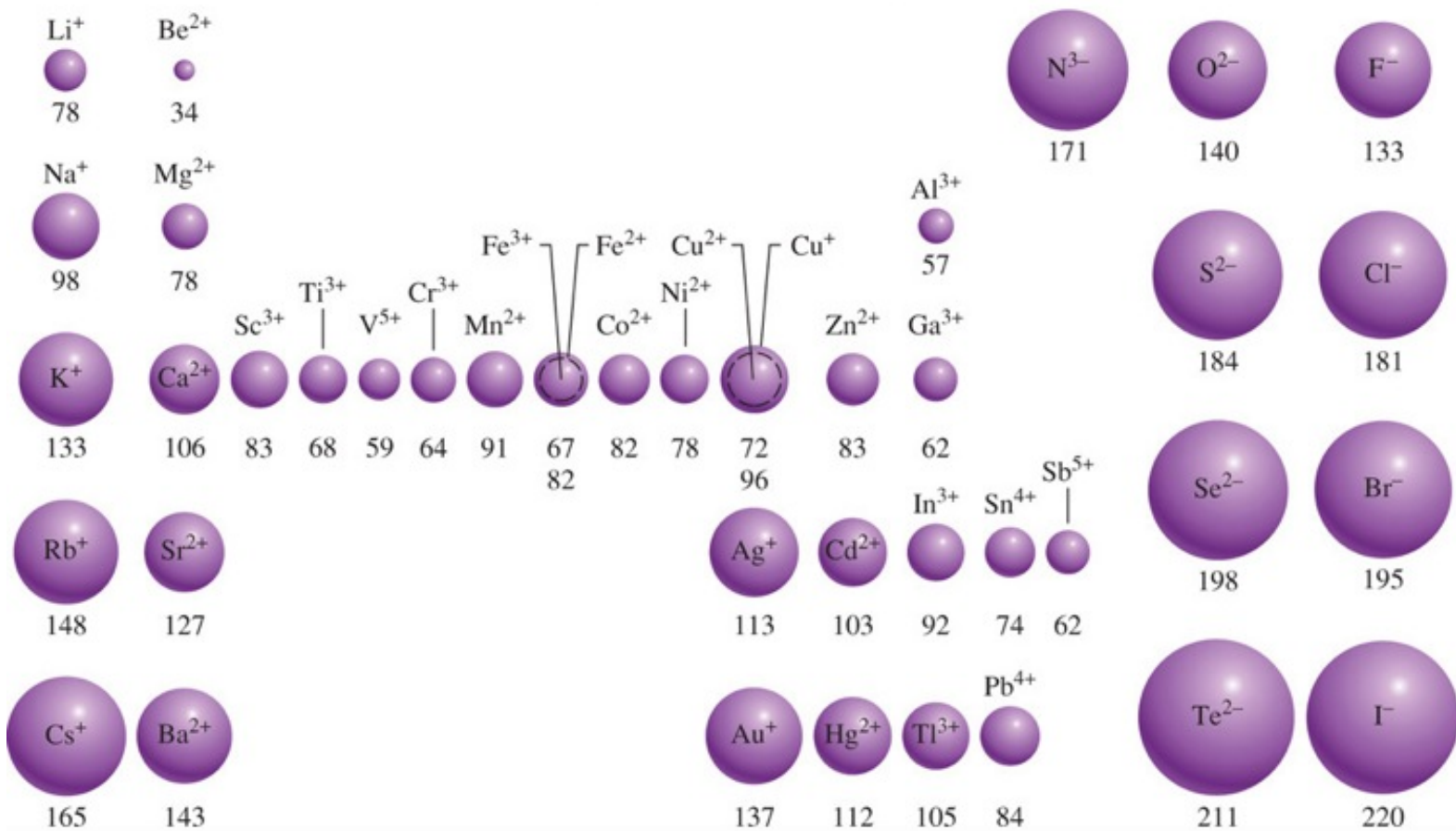


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Diagram illustrating the relative sizes of various ions, represented by purple spheres. The size of the sphere corresponds to the relative size of the ion, with larger numbers indicating larger ions.

Ions and their relative sizes (indicated by numbers):

- Li^+ (78)
- Be^{2+} (34)
- Na^+ (98)
- Mg^{2+} (78)
- Al^{3+} (57)
- K^+ (133)
- Ca^{2+} (106)
- Sc^{3+} (83)
- Ti^{3+} (68)
- V^{5+} (59)
- Cr^{3+} (64)
- Mn^{2+} (91)
- Fe^{3+} (67)
- Fe^{2+} (82)
- Co^{2+} (82)
- Ni^{2+} (78)
- Cu^{2+} (72)
- Cu^+ (96)
- Zn^{2+} (83)
- Ga^{3+} (62)
- Rb^+ (148)
- Sr^{2+} (127)
- Ag^+ (113)
- Cd^{2+} (103)
- In^{3+} (92)
- Sn^{4+} (74)
- Sb^{5+} (62)
- Cs^+ (165)
- Ba^{2+} (143)
- Au^+ (137)
- Hg^{2+} (112)
- Tl^{3+} (105)
- Pb^{4+} (84)
- N^{3-} (171)
- O^{2-} (140)
- F^- (133)
- S^{2-} (184)
- Cl^- (181)
- Se^{2-} (198)
- Br^- (195)
- Te^{2-} (211)
- I^- (220)



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