

IA	IIA	IIIA	IVA	VA	VIA	VIIA	VIIIA
Atomic radii							
H 0.37							He 0.31
Li 1.52	Be 1.12	B 0.85	C 0.77	N 0.75	O 0.73	F 0.72	Ne 0.71
Na 1.86	Mg 1.60	Al 1.43	Si 1.18	P 1.10	S 1.03	Cl 1.00	Ar 0.98
K 2.27	Ca 1.97	Ga 1.35	Ge 1.22	As 1.20	Se 1.19	Br 1.14	Kr 1.12
Rb 2.48	Sr 2.15	In 1.67	Sn 1.40	Sb 1.40	Te 1.42	I 1.33	Xe 1.31
Cs 2.65	Ba 2.22	Tl 1.70	Pb 1.46	Bi 1.50	Po 1.68	At 1.40	Rn 1.41

Ionic radii							
Li <sup>+</sup> 0.90	Be <sup>2+</sup> 0.59			N <sup>3-</sup> 1.71	O <sup>2-</sup> 1.26	F <sup>-</sup> 1.19	
Na <sup>+</sup> 1.16	Mg <sup>2+</sup> 0.85	Al <sup>3+</sup> 0.68			S <sup>2-</sup> 1.70	Cl <sup>-</sup> 1.67	
K <sup>+</sup> 1.52	Ca <sup>2+</sup> 1.14	Ga <sup>3+</sup> 0.76			Se <sup>2-</sup> 1.84	Br <sup>-</sup> 1.82	
Rb <sup>+</sup> 1.66	Sr <sup>2+</sup> 1.32	In <sup>3+</sup> 0.94			Te <sup>2-</sup> 2.07	I <sup>-</sup> 2.06	
Cs <sup>+</sup> 1.81	Ba <sup>2+</sup> 1.49	Tl <sup>3+</sup> 1.03					

2 Å

Atomic radii are often stated in angstroms ( $1 \text{ Å} = 10^{-10} \text{ m}$ ) or in the SI units nanometers ( $1 \text{ nm} = 10^{-9} \text{ m}$ ) or picometers ( $1 \text{ pm} = 10^{-12} \text{ m}$ ). To convert from Å to nm, move the decimal point to the left one place ( $1 \text{ Å} = 0.1 \text{ nm}$ ). For example, the atomic radius of Li is  $1.52 \text{ Å}$ , or  $0.152 \text{ nm}$ .

**Figure 6-1** (Top) Atomic radii of the A group (representative) elements and the noble gases, in angstroms, Å (Section 6-2). Atomic radii *increase going down a group* because electrons are being added to shells farther from the nucleus. Atomic radii *decrease from left to right within a given period* owing to increasing effective nuclear charge. Hydrogen atoms are the smallest and cesium atoms are the largest naturally occurring atoms.

(Bottom) Sizes of ions of the A group elements, in angstroms (Section 6-5). Positive ions (cations) are always *smaller* than the neutral atoms from which they are formed. Negative ions (anions) are always *larger* than the neutral atoms from which they are formed.