

page 874

2. Write the electron configuration for the element fitting each of the following descriptions.

a. The noble gas in the first period.

helium: $1s^2$ or [He]

b. The group 4B element in the fifth period.

zirconium: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^2$
or [Kr] $5s^2 4d^2$

c. The group 4A element in the sixth period.

lead: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^2$ or [Xe] $6s^2 4f^{14} 5d^{10} 6p^2$

d. The group 1A element in the seventh period.

francium: $1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^{10} 4p^6 5s^2 4d^{10} 5p^6 6s^2 4f^{14} 5d^{10} 6p^6 7s^1$ or [Rn] $7s^1$

Section 6-3

3. Using the periodic table and not Figure 6-11, rank each main group element in order of increasing size.

a. calcium, magnesium, and strontium

magnesium, calcium, and strontium

b. oxygen, lithium, and fluorine

fluorine, oxygen, and lithium

c. fluorine, cesium, and calcium

fluorine, calcium, and cesium

d. selenium, chlorine, and tellurium

chlorine, selenium, and tellurium

e. iodine, krypton, and beryllium

beryllium, krypton, and iodine

Chapter 8

Section 8-2

1. Explain the formation of an ionic compound from zinc and chlorine.

Zinc has two valence electrons. Chlorine has seven valence electrons. One zinc atom will lose two electrons forming a $2+$ ion. Two chlorine atoms will each gain one electron forming two $1-$ ions. The oppositely charged ions will attract and form the ionic compound $ZnCl_2$. The two positive charges balance the two negative charges.

2. Explain the formation of an ionic compound from barium and nitrogen.

Barium has two valence electrons. Nitrogen has five valence electrons. Three barium atoms will each lose two electrons forming three $2+$ ions. Two nitrogen atoms will each gain three electrons forming two $3-$ ions. The oppositely charged ions will attract and form the ionic compound Ba_3N_2 . The six positive charges balance the six negative charges.

Section 8-3

3. Write the chemical formula of an ionic compound composed of the following ions.

a. calcium and arsenide

Ca_3As_2

b. iron(III) and chloride

$FeCl_3$

c. magnesium and sulfide

MgS

d. barium and iodide

BaI_2

e. gallium and phosphide

GaP