1. For each of the ions below write out the electronic configuration in terms of sub-shells.

a. Na and Na^+ b. Cl and Cl^- c. Al and Al^{3+} d. O and O^{2-}

2. Give the electronic configuration of the following ions:

a. N^{3-} b. Cr^{3+} c. Cl^- d. Ca^{2+}

3. Write the formula for the following compounds:

a. sodium oxide b. Magnesium nitride c. aluminium oxide

d. iron(III) oxide e. Tin (IV) chloride f. calcium chloride

g. copper(I) oxide h. copper(II) oxide

4. Draw dot and cross diagrams to show bonding in:

a. aluminium chloride c. Magnesium oxide

5. Write a short sentence to explain the meaning of the following:

a. a cation

b. an anion

c. an ionic bond

d. electrostatic attraction

Ionic Bonding

Answers

1. For each of the ions below write out the electronic configuration in terms of sub-shells.

a. Na and Na^+ $1s^2 2s^2 2p^6 3s^1$ and $1s^2 2s^2 2p^6$

b. Cl and Cl^- $1s^2 2s^2 2p^6 3s^2 3p^5$ and $1s^2 2s^2 2p^6 3s^2 3p^6$

c. Al and Al^{3+} $1s^2 2s^2 2p^6 3s^2 3p^1$ and $1s^2 2s^2 2p^6$

d. O and O^{2-} $1s^2 2s^2 2p^4$ and $1s^2 2s^2 2p^6$

you could also write shortened electronic configurations based on the noble gas configurations, I have done this for the ones below.

2. Give the electronic configuration of the following ions:

a. N^{3-} $1s^2 2s^2 2p^6$ or [He] $2s^2 2p^6$

b. Cr^{3+} $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3$ or [Ar]$3d^3$

c. Cl^- $1s^2 2s^2 2p^6 3s^2 3p^6$ or [Ar]

d. Ca^{2+} $1s^2 2s^2 2p^6 3s^2 3p^6$ or [Ar]

3. Write the formula for the following compounds:

a. sodium oxide Na_2O

b. Magnesium nitride Mg_3N_2

c. aluminium oxide Al_2O_3

d. iron(III) oxide Fe_2O_3

e. Tin (IV) chloride $SnCl_4$

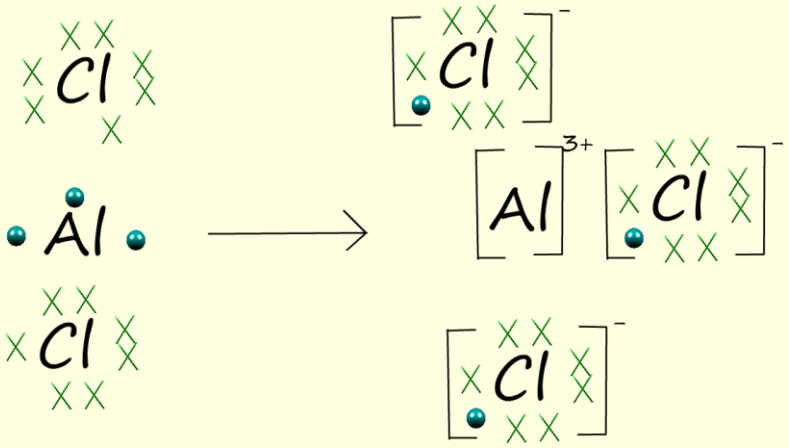
f. calcium chloride $CaCl_2$

g. copper(I) oxide Cu_2O

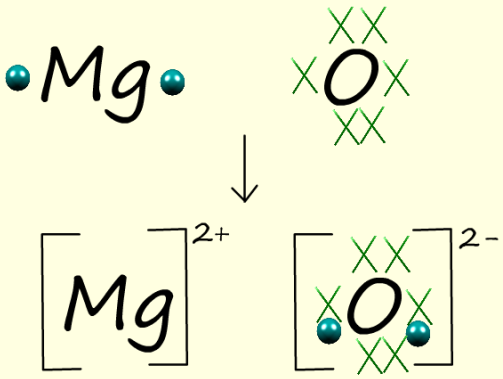
h. copper(II) oxide CuO

4. Draw dot and cross diagrams to show bonding in:

a. aluminium chloride



b. Magnesium oxide



5. Write a short sentence to explain the meaning of the following:

a. a cation -a positively charged ion.

b. an anion -a negatively charged ion.

c. an ionic bond -electrostatic attraction of oppositely charged ions.

d. electrostatic attraction- attraction between + and - charges.