Classwork – May -8

<u>Oxides</u> are chemical compounds that have two elements in their composition. One of these two elements must be oxygen.

There are <u>acidic and basic oxides</u>.

Most acidic oxides are soluble:

 $CO_2 + H_2O \rightarrow H_2CO_3$ 

 $SO_2 + H_2O \rightarrow H_2SO_3$ 

Some are not:

 $SiO_2 + H_2O \rightarrow$  no reaction

All acidic oxides are soluble in bases:

 $SiO_2 + 2NaOH \rightarrow Na_2SiO_3 + H_2O$ 

 $Na_2SiO_3 + 2 HCl \rightarrow H_2SiO_3$  (metasilicic acid) + 2NaCl

An acid corresponds to each acidic oxide.

General definition of acidic oxides is:

"Oxides that interact with bases forming salt and water are called acidic oxides"

Acidic oxides are mostly formed by non-metals. Some metals can form acidic oxides in their highest oxidation state:  $Cr(VI) \rightarrow H_2CrO_4$  chromic acid;  $Mn(VII) \rightarrow HMnO_4$  permanganic acid

<u>Basic oxides</u> are formed only by metals. Some react with water, some don't. All basic oxides react with acids.

 $CaO + H_2O \rightarrow Ca(OH)_2$ 

 $ZnO + H_2O \rightarrow no reaction$ 

 $ZnO + 2HCl \rightarrow ZnCl_2 + H2O; ZnCl_2 + NaOH \rightarrow Zn(OH)_2 + 2NaCl$ 

To each basic oxide corresponds a base:

 $MgO \rightarrow Mg(OH)_2$ 

 $Fe_2O_3 \rightarrow Fe(OH)_3$ 

Na2O → NaOH

## Oxides that react with acids forming salt and water are called **basic oxides**.

In their lowest oxidation state Cr(II) and Mn (II) form based oxides:

 $CrO \rightarrow Cr(OH)_2$  (unstable, transforms to Cr(III))

 $MnO \rightarrow Mn(OH)_2$