The Automatic Professor Teaches you about:

5.2 Salts

Instructions: Fill in the notes while you watch the video. Make headings, skip lines between topics, and underline headings. Use color to help your brain learn.

- C2.3 I can differentiate between acids, bases, and salts with respect to chemical formulae and properties.
- C2.5 I can use the periodic table to
  - Identify the relative reactivity of elements in the alkali metal, alkaline earth metal, halogen, and noble gas groups
  - Distinguish between metal oxide solutions (basic) and non-metal oxide solutions (acidic)

Acid Base Neutralization

- When an acid and base react, a _____reaction takes place.
- The general equation for all neutralization reactions is: **Acid + base → salt + water**
- In each of the reactions below, **label the acid, base, salt and water**:
  - $HCl + NaOH \rightarrow NaCl + H_2O$
  - $3H_2SO_4 + 2Al(OH)_3 \rightarrow Al_2(SO4)_3 + 6\ H_2O$
  - $2CH_3COOH + Mg(OH)_2 \rightarrow Mg(CH_3COO)_2 + 2H_2O$

Do the practice problems on p. 236.

Metal Oxides

- Metals react with oxygen to form oxides to produce a metal oxide.
- When a metal oxide dissolves in water, the solution becomes _____.
- Label the metal oxide, water and the base that forms:
  - $Na_2O_{(s)} + H_2O_{(l)} \rightarrow NaOH_{(aq)}$
  - $CaO_{(s)} + H_2O_{(l)} \rightarrow Ca(OH)_{2(aq)}$

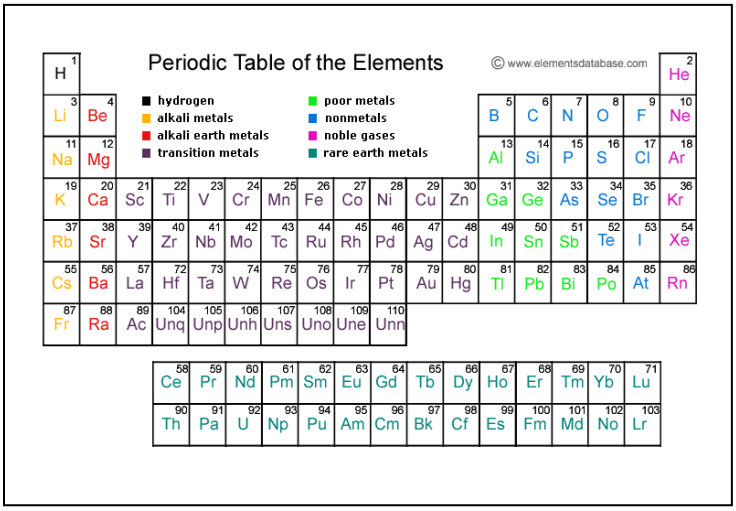
Non-metal oxides

- _____react with oxygen to form non-metal oxides. (ex. Carbon dioxide, sulphur dioxide)
- When a non-metal oxide dissolves in water, the solution becomes _____.
- Label the non-metal oxide, water and _____.

- $SO_{2(g)} + H_2O_{(l)} \rightarrow H_2SO_{3(aq)}$
- $SO_{3(g)} + H_2O_{(l)} \rightarrow H_2SO_{4(aq)}$
- $2NO_{2(g)} + H_2O_{(l)} \rightarrow HNO_{2\,(aq)} + HNO_{3(g)}$
- $CO_{2(g)} + H_20_{(l)} \rightarrow H_2CO_{3(aq)}$

- How are the above reactions related to fossil fuels and acid rain?
- On the periodic table, shade the elements that form metal oxides light blue and shade the elements that form non-metal oxides light yellow.

Acids and Metals



- **The most reactive metals** are on the extreme left of the periodic table and are known as alkalai metals and _____ metals. Highlight them on the periodic table.
- Why is cesium more reactive than sodium?
- **Less reactive metals** include copper, silver, gold, and platinum.
- When metals react with acids they usually give off _____ gas. Label below: acid, metal, hydrogen gas.

$2HCl_{(aq)} + Mg_{(s)} \rightarrow MgCl_{2(aq)} + H_{2(g)}$

$2H_2SO_{4(aq)} + 2Al_{(s)} \rightarrow Al_2(SO_4)_{3(aq)} + 3H_{2(g)}$

Do the practice problems on p. 238.

Acids and Carbonates

- Much of the carbon dioxide on earth is trapped in rocks as _____., dolomite and calcite that contain carbon ions. When these rocks react with acids the carbonates help neutralize the acids.
- Write the word equations below each of the equations below.

$H_2SO_4 + CaCO_3 \rightarrow CaSO_4 + H_2O + CO_2$

$2HNO_3 + CaCO_3 \rightarrow Ca(NO_3)_2 + H_2O + CO_2$

In western Canada, many lakes are located in rocky areas with limestone deposits that neutralize acid rain. In eastern Canada, many lakes do not have limestone deposits. Where does acid rain impact the environment more? Why?