

Name: Key
Blk: _____ Date: _____

Chemistry 11 CONSERVATION LAWS + BALANCING EQUATIONS

A CONSERVATION LAW- an experimentally observed law that states what is CONSERVED in a special set of circumstances

THERE ARE FOUR CONSERVATION LAWS that you must familiarize yourself with:

Sc-8 1. Law of Conservation of ENERGY- The total energy in a "CLOSED" system does not change during a chemical rxn

Sc-9 2. Law of Conservation of MASS- The total mass in a closed system does not change during a chemical rxn

Sc-10 3. Law of Conservation of ATOMS- The number + type of atoms in a closed system does not change during a chemical rxn

chem 12 4. Law of Conservation of ELECTRICAL CHARGE- The total electrical charge in a closed system does not change during a chemical rxn

When a Chemical Equation is BALANCED, then mass, atoms and electrical charge are CONSERVED!!!

Example 1. Balance the following chemical equations:

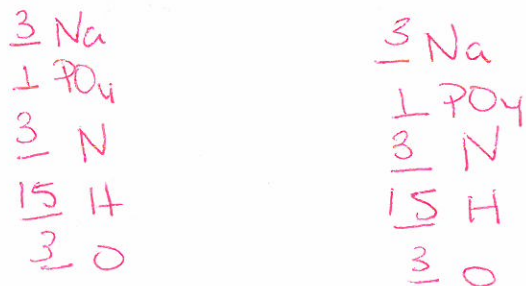
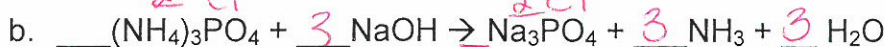
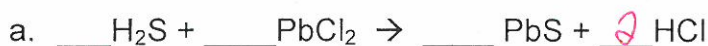
RECALL THE (ME-NOH CHEMISTRY) TECHNIQUE

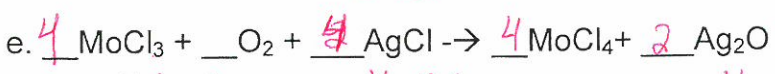
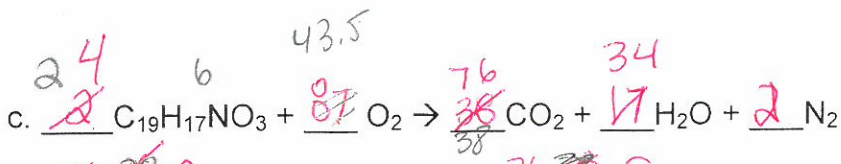
Step 1. First balance the Metals,

Step 2. Then balance the "IONS"

Step 3. Then balance the Non-metals

Step 4. Balance the O + H's last!





Including PHASES in Chemical Equations:

Recall that the following lower case letters represent a different PHASE for the species in a chemical reaction:

s = solid l = liquid g = gas aq = aqueous

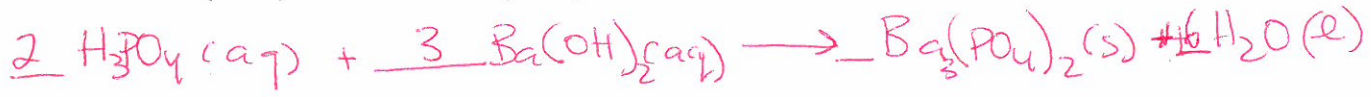
Recall the DIATOMIC elements- $\text{H}_2, \text{N}_2, \text{O}_2, \text{F}_2, \text{Cl}_2, \text{Br}_2, \text{I}_2$

IMPT: When SULFUR appears by itself in a chemical equation it has the chemical formula of S₈!!!

The words crystals, powder and precipitate all refer to a SOLID substance. A precipitate is used to refer to a situation when a solid is produced when TWO LIQUIDS are mixed.

Example 2. Translate the following word equations into chemical equations with phases and then balance the result.

a. Aqueous phosphoric acid reacts with aqueous barium hydroxide to produce water and a precipitate of barium phosphate:



b. Solid Sulphur reacts with hydrogen gas to produce gaseous Hydrosulphic acid:

