

Predicting Synthesis & Decomposition Reactions



Writing Chemical Reactions

- In order to be able to write a chemical reaction, you **MUST** know how to write formulas from names!
- If you still cannot do this...you are going to have **MAJOR** trouble

Small Intro to Redox (MUCH more on this later!)

- A reaction in which electrons are transferred from one atom to another is called an _____ **reaction**.

Determining Oxidation Numbers

1. The oxidation number for any uncombined elements or diatomic molecule is _____
2. The oxidation number for a monatomic ion is its _____
3. The oxidation number of Hydrogen is usually _____. The exception is in a _____ where the oxidation number will be -1
4. The oxidation number of oxygen is usually _____ EXCEPT in _____. Then it is -1

Determining Oxidation Numbers

5. In binary compounds (nonmetal + nonmetal) the positive one is first and the negative one is second
6. The sum of the oxidation numbers for all atoms in a neutral compound is _____
7. The sum of the oxidation numbers in a polyatomic ion is equal to the _____ of the polyatomic ion

Steps for Writing Ionic Equations

1. Write the balanced molecular equation (balanced chemical equation)
2. Break every thing down into its ions **EXCEPT** the _____, _____, _____, or _____ (complete ionic equation)
3. Cross out everything that is the same on both sides (_____ ions)
4. Write what is left (net ionic equation)

Synthesis # 1

1. Metal oxide + nonmetal oxide \rightarrow salt (Not Redox)
 - Not redox means the middle element in the salt will have the same oxidation number at the nonmetal reactant

Synthesis # 1 Example

- Sulfur dioxide gas is passed over solid calcium oxide

Synthesis # 2

2. Metal oxide + water \rightarrow base (Not Redox)
- Solid sodium oxide is added to water

Synthesis #3

3. Non metal oxide + water \rightarrow acid (Not Redox)
- Sulfur dioxide gas is placed in water

Synthesis # 4

4. Metal + nonmetal \rightarrow salt
- A salt is just an ionic compound (a positive charge & a negative charge)
 - Magnesium metal is combusted in nitrogen gas

Synthesis #5

5. Metal chloride + oxygen \rightarrow Metal chlorate
- Magnesium chloride reacts with oxygen

Decomposition

- Decomposition reactions are just synthesis reactions backward