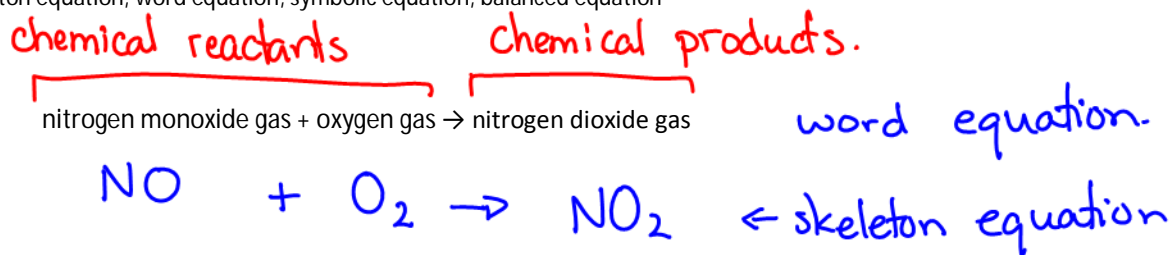


Science 10

Notes: Chemical Reactions – Writing and Balancing Equations

Terms to know:

Reactants, products, chemical reaction, law of conservation of mass,
Skeleton equation, word equation, symbolic equation, balanced equation



Law of conservation of mass: mass of all reactants = mass of products.

For chemical reactions, this means that the number of atoms in the reactants must equal:

the number of atoms in the products.

How to balance a chemical reaction:

1. Start with the skeleton equation. You may need to find the chemical formulas from the names of the compounds.

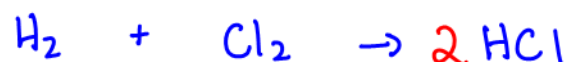
Be aware of common names: water : H_2O

And

Diatomic molecules: $\text{O}_2, \text{N}_2, \text{H}_2, \text{Cl}_2, \text{I}_2, \text{Br}_2, \text{F}_2$

2. Simple equations can be balanced by adding coefficients by trial and error / common sense
 - * a. Balance compounds first
 - b. Add coefficients only. Do not change subscripts
 - c. If you add a coefficient to a compound, balance all of those atoms first before moving on
 - d. Make sure that all of the coefficients are whole numbers. You can double or triple all of the coefficients if necessary
 - e. Polyatomic ions can be treated as a whole unit

Eg: $\text{H}_2(\text{g}) + \text{Cl}_2(\text{g}) \rightarrow \text{HCl}(\text{aq})$



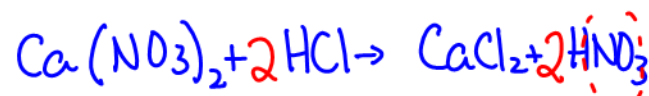
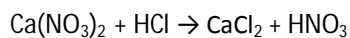
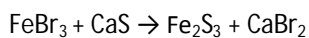
H ✓
Cl ✓

$\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$



H ✓
C ✓ O

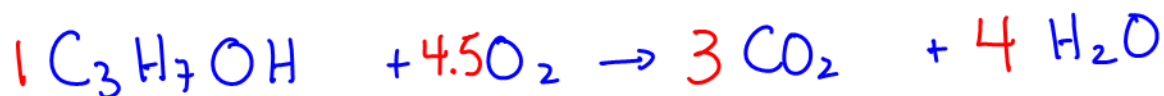
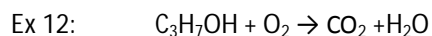
3. Balance the following:



Fe ✓
Br ✓
Ca ✓
S ✓

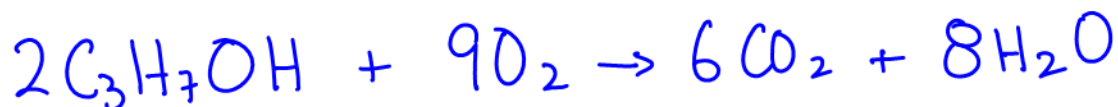
NO₃ ✓
Ca ✓
H ✓
Cl

4. Complicated equations can be balanced by counting atoms:



C ✓
H ✓

multiply to get rid of decimal or fraction coefficients



Eg. Plants convert carbon dioxide gas and water into glucose (C₆H₁₂O₆) and oxygen



C ✓

H ✓

$$\text{O} : 12 + 6 = 6 + \underline{12}$$

p77 workbook.

p78-79