

Chemical Equations

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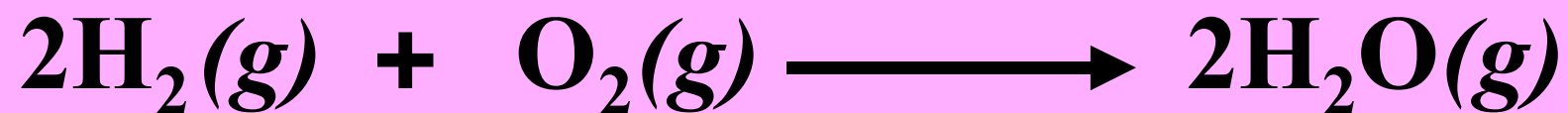
shows the results of a chemical process

reactants (reagents)  products

coefficients

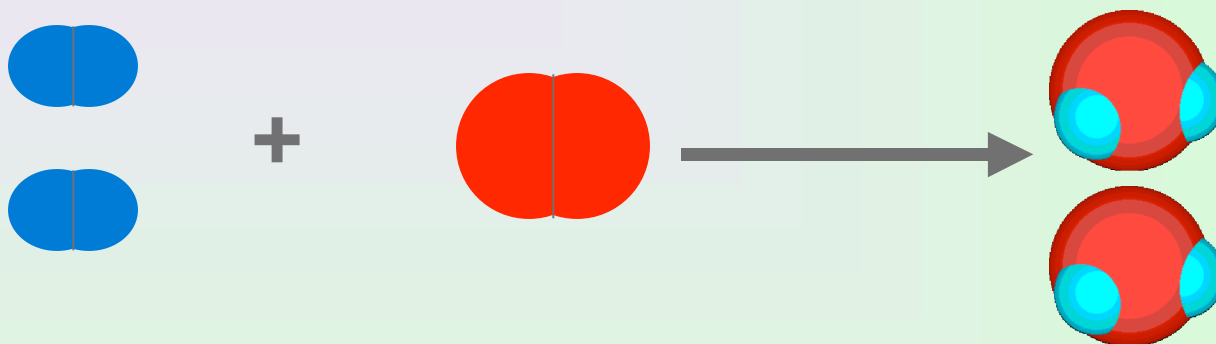
**the numbers in front of formulas in
chemical equations**

**gives the relative number of molecules
taking part in a reaction**



Chemical bonds have been broken and new chemical bonds have been formed

Writing Chemical Equations



2 moles

1 mole

2 moles

4.04 g

32.00 g

36.04 g

Parentheses show physical state of substances

physical state of substances

(s) = solid

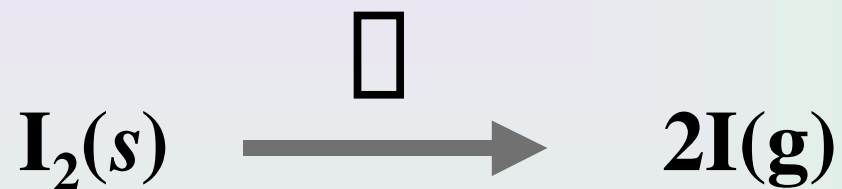
(l) = liquid

(g) = gas

(aq) = aqueous (dissolved in water)

Example

molecular interpretation



1 molecule of solid iodine when heated (\square)
gives 2 atoms of iodine in the gas phase

Example

molar interpretation



Start: 1 mol 1 mol 0

Finish: 0 0 2 mol

Example

mass interpretation



Start: 4g 32g 0

Finish: 0 0 36 g

**The law of conservation of mass
requires that chemical equations
must balance.**

What goes in



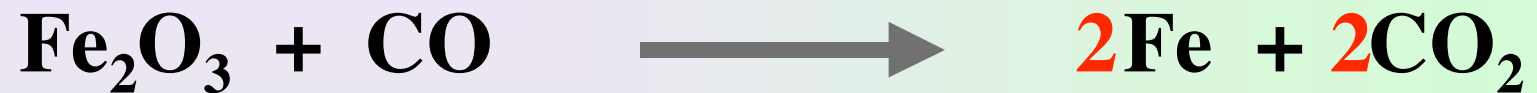
Must come out

Writing and balancing the equation for a chemical reaction

- 1. Identify all reactants and products and write their correct formulas on the left side and right side of the equation, respectively.**
- 2. Begin balancing the equation by trying suitable coefficients that will give us the same number of atoms of each element on both sides of the equation. Change coefficients, but not subscripts.**
- 3. Look for elements that appear only once on each side of the equation. Balance these first.**
- 4. Check.**

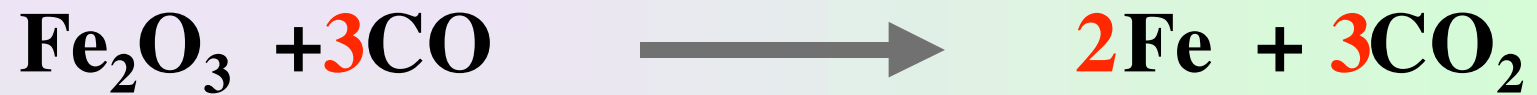
Example

Balance the following equation



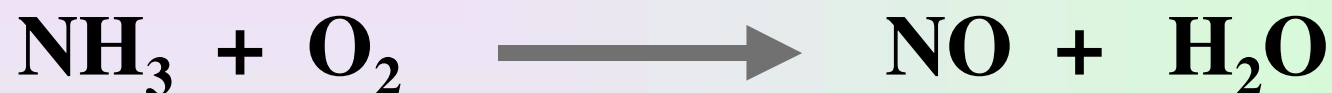
Example

Balance the following equation

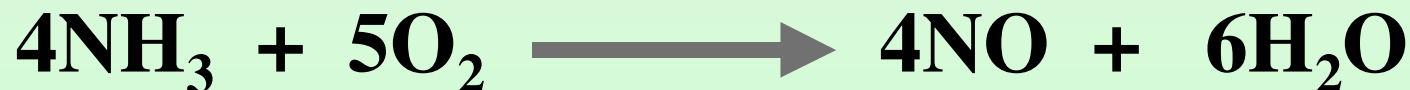


Example

Balance the following equation



multiply everything by 2



Showing energy changes in equations

endothermic reaction



exothermic reaction

