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④ Solid + Solution → products

35g 50g ? 85g

85g 85g

⑤ A + B → solution + gas

60g 40g 85g 15g

100g 100g

② log → ashes + smoke (gases)

100g 70g 30g

100g

Counting Atoms

$CaSO_4$

$Mg(NO_3)_2$

$2NaCl$

$3Al(HCO_3)_3$

Counting Atoms Sheet

$NH_4C_2H_3O_2$

N → 1
H → 7
C → 2
O → 2
12

$(NH_4)_2Cr_2O_7$

$(NH_4)_2Cr_2O_7$

$2(NH_4)_2Cr_2O_7$

N → 4
H → 16
Cr → 4
O → 14
38

Law of Conservation of Mass

In a chemical reaction, the total mass of the reactants is always equal to the total mass of the products.

Balancing Chemical Equations

Skeleton Chemical Equation

Represents the chemical reaction, connecting the reactants to the products.

Ex. methane + oxygen ⇒ carbon dioxide + water

$$\_CH_4 + 2O_2 \Rightarrow \_CO_2 + 2H_2O$$

Count the Atoms!

ATOM	REACTANTS	PRODUCTS
C	1	1
H	4	2
O	2	3

Tips for balancing chemical equations:

- **You can only add coefficients (number in front of formula)**
- **Balance each atom individually, unless it appears to be a polyatomic compound**
- **Choose the 'easy' atoms first**

$$2Mg_{(s)} + O_{2(g)} \longrightarrow 2MgO_{(s)}$$

Balance the following chemical equations:

$$Mg_{(s)} + O_{2\,(g)} \longrightarrow MgO_{(s)}$$

$$3H_2 + N_2 \longrightarrow 2NH_3$$

$$2Al + 3CuO \longrightarrow Al_2O_3 + 3Cu$$

$$CaCl_2 + 2AgNO_3 \longrightarrow 2AgCl + Ca(NO_3)_2$$

Homework
P. 229 #1-3d

3.a) $CuO + H_2 \rightarrow Cu + H_2O$

b) $Pb(NO_3)_2 + KI \rightarrow PbI_2 + KNO_3$

c) $Ca + H_2O \rightarrow Ca(OH)_2 + H_2$

d) $PbS + O_2 \rightarrow Pb + SO_2$