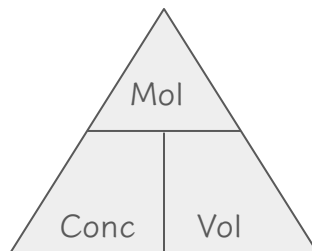
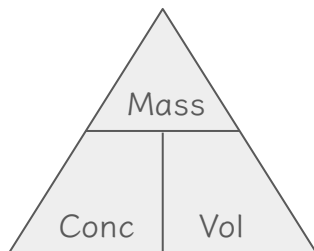
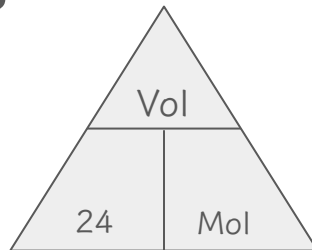
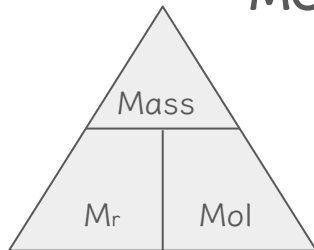


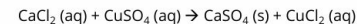
MOLE CONCEPTS



The Avogadro's Constant: 6.02×10^{23}

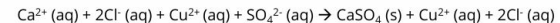
Step 1

Write the balanced chemical equation for the reaction.



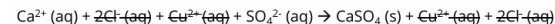
Step 2

Ionic compounds that are in **aqueous state** should be written as **ions**.



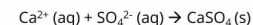
Step 3

Remove all the spectator ions.



Step 4

Obtain the final ionic equation.



Ionic Equations $\uparrow \uparrow$
Limiting Reactants $\downarrow \downarrow$

LIMITING AND EXCESS REACTANTS

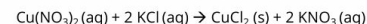
Not all the reactants are always fully used up in a chemical reaction.

The reaction will stop when one reactant is fully used up, even if the other reactants are still available.

The **limiting reactant** is the reactant that is **completely used up** first. It **limits the amount of product** that can be formed.

The **excess reactant** is the reactant that would **still remain** in excess even when the limiting reactant has been completely reacted.

Example:



Hypothetically, let's say there is 1 mole of $\text{Cu}(\text{NO}_3)_2$ & 5 moles of KCl.

As there is only 1 mole of $\text{Cu}(\text{NO}_3)_2$, so even if there are 5 moles of KCl, only 2 moles of KCl will react.

$\text{Cu}(\text{NO}_3)_2$ is the limiting reactant while KCl is the excess reactant.