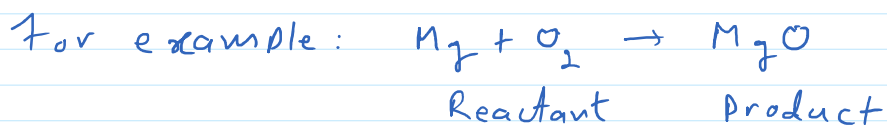


Unbalanced chemical equation

An unbalanced chemical equation has unequal number of atoms of one or more elements in the reactants and products.



Balanced chemical equation

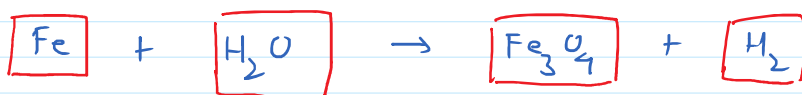
Balanced chemical equation has equal number of atoms of different elements in the reactants and products.



Balancing of a chemical equation

Step 1

Draw boxes around each formula. Do not change anything inside the boxes while balancing the equation



Step 2

List the number of atoms of different elements present in the unbalanced equation.

Element	No. of atoms on reactant side	No. of atoms on product side
Fe	1	3
H	2	2
O	1	4

Step 3

Balance the compound containing maximum no. of atoms.
 In that compound select the element which has maximum number of atoms.

Thus Fe_3O_4 is selected and balance O in it.

Atoms of	In reactants	In products.
oxygen		
i) Initial	1 in H_2O	4 in Fe_3O_4
ii) (to balance)	1×4	4



Step 4

Balance remaining atoms.

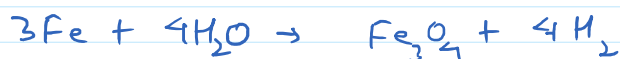
Balancing hydrogen

Atoms of hydrogen	In reactants	In products
i) Initial	8 in H_2O	2 in H_2
ii) To balance	8	2×4



Balance iron

Atoms of Fe	In reactants	In products
i) Initial	1 in Fe	3 in Fe_3O_4
ii) to balance	1×3	3



Step 5

Count atoms of each element on both sides of the equation to verify the correctness of balanced chemical equation.

Step 6

To make a chemical equation more informative, the physical states of the reactants and products are mentioned along with their chemical formula.

(g) → gaseous state, (l) → liquid state
(s) → solid state, (aq) → aqueous state.



Sometimes the reaction conditions such as temperature, pressure, catalyst etc for the reaction are indicated above and/or below the arrow in the equation.

