

Chemical Reactions and Equations Class 10 Notes

Free Class 10 chemistry notes on balancing equations, reaction types, oxidation and reduction, corrosion and rancidity, with a downloadable PDF.

Name: _____ Date: _____

A chemical reaction changes reactants into products with different chemical identities. A chemical equation records that change using formulas. In a balanced equation, each element has the same number of atoms on both sides; atoms are rearranged rather than created or destroyed.

How to balance chemical equations

Balance $\text{Al} + \text{O}_2 \rightarrow \text{Al}_2\text{O}_3$

1. Start with correct formulas. Oxygen occurs in groups of 2 on the left and 3 on the right.
2. Use six oxygen atoms: put 3 before O_2 and 2 before Al_2O_3 .
3. There are now four aluminium atoms on the right, so put 4 before Al.
4. Balanced equation: $4\text{Al} + 3\text{O}_2 \rightarrow 2\text{Al}_2\text{O}_3$. Check Al: 4 each side; O: 6 each side.
5. Use the smallest whole-number coefficients. Add physical states and required conditions when known. Never change the subscripts in a formula.

Types of chemical reactions with examples

Type	Pattern	Example and condition
Combination	Several reactants form one product	$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$ when magnesium burns.
Decomposition	One reactant forms several products	$\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$ on heating.
Displacement	An element replaces another in a compound	$\text{Zn} + \text{CuSO}_4 \rightarrow \text{ZnSO}_4 + \text{Cu}$ in solution.
Double displacement	Ions exchange partners	$\text{AgNO}_3 + \text{NaCl} \rightarrow \text{AgCl} + \text{NaNO}_3$ in aqueous solution; AgCl precipitates.
Redox	Oxidation and reduction occur together	$\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$ on heating.

These categories can overlap. Burning magnesium is both a combination reaction and an oxidation process. Exothermic and endothermic describe energy transfer, rather than a separate pattern of how many reactants become how many products.

Oxidation and reduction: the difference

In the oxygen-based model used in this chapter, oxidation is gain of oxygen and reduction is loss of oxygen. In $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$, hydrogen gains oxygen and is oxidised, while copper(II) oxide loses oxygen and is reduced. The changes occur together. More general definitions use electron transfer.

Corrosion and rancidity: the difference

Feature	Corrosion	Rancidity
What changes	A metal reacts with its surroundings.	Fats and oils oxidise and deteriorate.
Example	Rusting of iron in moist air.	Oil developing an unpleasant smell.
Ways to slow it	Protective paint or suitable coatings.	Reduce oxygen exposure; appropriate cool storage can help.

Revision questions

1. Balance $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$. Answer: $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$.
2. Which is reduced in $\text{ZnO} + \text{C} \rightarrow \text{Zn} + \text{CO}$? Answer: ZnO loses oxygen.
3. Can you change MgO to MgO_2 to balance an equation? No; that changes the substance.
4. Why can one reaction have several labels? The labels describe different features, such as product pattern, oxygen transfer and energy change.

Important questions and interactive MCQs:

<https://udayy.com/en/lesson/chemical-reactions-important-questions-mcq>

NCERT exercise answer companion: <https://udayy.com/en/lesson/chemical-reactions-ncert-solutions>

Topic reference: NCERT Science, Chemical Reactions and Equations: <https://ncert.nic.in/textbook/pdf/jesc101.pdf>

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