



CLASS 10 SCIENCE · 2026-27

Chemical reactions and equations

Chemistry

32

QUESTIONS

30

MINUTES

3

EXERCISES

This belongs to _____ Date _____

WHAT YOU'LL GET GOOD AT

- Balances an equation reliably, including with polyatomic ions
- Names the type of a reaction and gives the reason
- Identifies what is oxidised and what is reduced
- Explains corrosion and rancidity, and one way of preventing each

Take your time, and have a go at every one. If you get stuck, look at the orange box — Ollie has already done one for you.

Chemical reactions and equations

Chemistry · 32 questions · tick each box as you finish

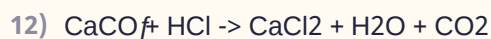
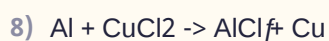
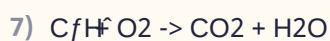
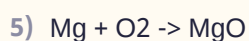
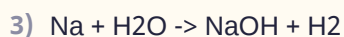
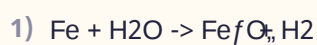
Exercise 1 of 3 · 12 questions Balance each equation.



WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

For the last equation, treat SO_4 as a single unit rather than counting sulphur and oxygen separately. There are three sulphate groups on the left, so three BaSO_4 on the right; that gives three Ba on the left; two Al on the left means 2AlCl_3 on the right, which needs six Cl, so 3BaCl_2 . Balancing polyatomic ions as units rather than as separate atoms turns the hardest equations in the chapter into the same problem as the easiest.

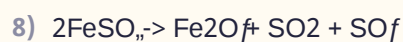
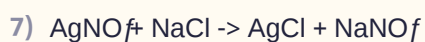
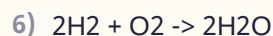
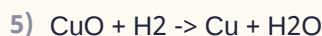


Exercise 2 of 3 · 10 questions Name the type of reaction and give the reason.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

The last reaction is the one to understand rather than label. Oxidation and reduction always happen together - one substance cannot lose oxygen unless another gains it. CuO is reduced to Cu, and H₂ is oxidised to H₂O. Naming the type is one mark; saying which substance underwent which change is the answer, and that is the form the board asks it in.



Exercise 3 of 3 · 10 questions Answer in two or three sentences.

WRITE THE ANSWER

HERE'S ONE DONE FOR YOU

The iron nail question wants both halves - the chemistry and the observation. What is seen is what proves the reaction happened: blue fading to green, and a reddish-brown deposit. Answers that give the equation and no observation are missing exactly the part the question was set to test, and this is one of the most frequently asked questions in the whole syllabus.

1) What happens when an iron nail is dipped in copper sulphate solution? What would you see?

2) Why are chips packets flushed with nitrogen?

3) What is corrosion, and give one way of preventing the rusting of iron.

4) Why is respiration described as an exothermic reaction?

5) Why should a magnesium ribbon be cleaned before burning?

6) Why does silver turn black when left in air?

7) What is rancidity, and give one way it is prevented?

8) Why is a displacement reaction useful for extracting a metal?

9) Why does the reaction of quicklime with water make the container warm?

10) Why is copper sulphate solution stored in a plastic rather than an iron container?

**All done? How did that feel?**

Colour in a star. Three stars means you could teach it to someone else.



Tricky · Getting there · Easy now



Answer key

For grown-ups

Chemical reactions and equations · keep this page back until your child has finished.

1. Balance each equation.

- 1) $3\text{Fe} + 4\text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + 4\text{H}_2$
- 2) $\text{H}_2 + \text{Cl}_2 \rightarrow 2\text{HCl}$
- 3) $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
- 4) $2\text{NaOH} + \text{H}_2\text{SO}_4 \rightarrow \text{Na}_2\text{SO}_4 + 2\text{H}_2\text{O}$
- 5) $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$
- 6) $3\text{BaCl}_2 + \text{Al}_2(\text{SO}_4)_3 \rightarrow 3\text{BaSO}_4 + 2\text{AlCl}_3$
- 7) $\text{C}_3\text{H}_8 + 5\text{O}_2 \rightarrow 3\text{CO}_2 + 4\text{H}_2\text{O}$
- 8) $2\text{Al} + 3\text{CuCl}_2 \rightarrow 2\text{AlCl}_3 + 3\text{Cu}$
- 9) $3\text{KOH} + \text{H}_3\text{PO}_4 \rightarrow \text{K}_3\text{PO}_4 + 3\text{H}_2\text{O}$
- 10) $\text{Fe}_2\text{O}_3 + 3\text{C} \rightarrow 2\text{Fe} + 3\text{CO}$
- 11) $2\text{Pb}(\text{NO}_3)_2 \rightarrow 2\text{PbO} + 4\text{NO}_2 + \text{O}_2$
- 12) $\text{CaCO}_3 + 2\text{HCl} \rightarrow \text{CaCl}_2 + \text{H}_2\text{O} + \text{CO}_2$

2. Name the type of reaction and give the reason.

- 1) Combination - two substances combine to form a single product. It is also exothermic, since heat is given out.
- 2) Decomposition, and specifically thermal decomposition, since a single compound breaks down on heating into simpler products.
- 3) Displacement - zinc is more reactive than copper, so it displaces copper from its salt solution.
- 4) Double displacement, and a precipitation reaction, since the ions exchange partners and insoluble barium sulphate separates out as a white precipitate.
- 5) Redox. Copper oxide loses oxygen and is reduced; hydrogen gains oxygen and is oxidised. Both happen in the same reaction, which is why it is called redox.
- 6) Combination, because two substances join to form a single product.
- 7) Double displacement and precipitation, because the ions exchange partners and insoluble AgCl is formed.
- 8) Thermal decomposition, because one compound breaks into three on heating.
- 9) Displacement, because the more reactive iron takes the place of copper in the salt.
- 10) Photolytic decomposition, because light supplies the energy that breaks the compound down.

3. Answer in two or three sentences.

- 1) Iron is more reactive than copper, so it displaces copper from the solution, forming iron sulphate. The blue colour of the solution fades to pale green and a reddish-brown deposit of copper forms on the nail.
- 2) To prevent the oil in the chips from being oxidised, which would make them rancid. Nitrogen is unreactive, so replacing the air removes the oxygen without affecting the food.
- 3) Corrosion is the gradual eating away of a metal by the action of air, moisture or chemicals on its surface. Rusting can be prevented by painting, oiling, galvanising with zinc, or by using an alloy such as stainless steel.
- 4) Because energy is released during it. Glucose is broken down using oxygen to give carbon dioxide, water and energy, and that energy is what the body runs on - which makes it exothermic by definition.
- 5) Because magnesium reacts with air to form a layer of magnesium oxide on its surface, which prevents the ribbon from burning properly. Cleaning with sandpaper removes the oxide layer.
- 6) Because silver reacts with the hydrogen sulphide in air to form a black layer of silver sulphide. This is corrosion, though it is only surface-deep.
- 7) The oxidation of fats and oils in food, which makes it smell and taste bad. Flushing packets with nitrogen, storing in airtight containers or adding antioxidants all slow it down.
- 8) Because a more reactive metal can displace a less reactive one from its compound. That gives a way to obtain the less reactive metal without needing to reduce its ore directly.
- 9) Because it is an exothermic reaction, which releases heat as it goes. The heat raises the temperature of the container along with the mixture.
- 10) Because iron is more reactive than copper and would displace it from the solution. The iron container would slowly dissolve and the copper sulphate would be lost.

WHILE YOUR CHILD WORKS

- Balance polyatomic ions as single units. SO_4 counted as one thing rather than five atoms makes the hard equations easy.
- For reaction types, insist on the reason. 'Displacement, because zinc is more reactive than copper' is the whole answer.
- For everyday questions, insist on the observation. What you would see is what the mark is for.

**Spotted a gap while marking?**

A free assessment is one live class with a matched teacher - no card, nothing to cancel. Afterwards you get an honest note on what they noticed.

Book a free assessment - [scholur.com/contact](https://www.scholur.com/contact)