

SCIENCE • CLASS 10

CHAPTER 1

# Chemical Reactions and Equations

NCERT SOLUTIONS



# OXIDATION AND REDUCTION

**Exercise 1** — Which statements about this reaction are incorrect?



- |                                         |                                    |
|-----------------------------------------|------------------------------------|
| (a) Lead is getting reduced.            | (c) Carbon is getting oxidised.    |
| (b) Carbon dioxide is getting oxidised. | (d) Lead oxide is getting reduced. |

**Choices:** (i) (a) and (b); (ii) (a) and (c); (iii) (a), (b) and (c); (iv) all.

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## Solution

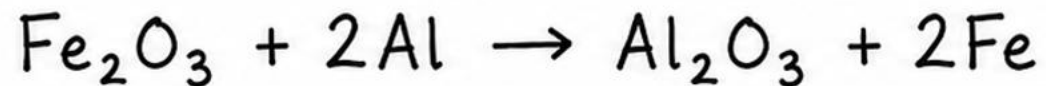
**Answer:** (i) — (a) and (b).

- Lead oxide loses oxygen and changes into lead. So lead oxide is reduced; lead metal is the product.
- Carbon gains oxygen and forms carbon dioxide. So carbon is oxidised, not carbon dioxide.

Therefore, statements (c) and (d) are correct.

# DISPLACEMENT REACTIONS

Exercise 2 — What type of reaction is this?



- (a) Combination
- (b) Double displacement
- (c) Decomposition
- (d) Displacement

## Solution

Answer: (d) Displacement.

Aluminium is more reactive than iron. It displaces iron from iron(III) oxide.

Exercise 3 — What happens when dilute hydrochloric acid is added to iron filings?

- (a) Hydrogen gas and iron chloride form.
- (b) Chlorine gas and iron hydroxide form.
- (c) No reaction takes place.
- (d) Iron salt and water form.

## Solution

Answer: (a).



Iron(II) chloride forms, and hydrogen gas is released as bubbles.

# BALANCED CHEMICAL EQUATIONS

## Exercise 4 —

What is a balanced chemical equation? Why should chemical equations be balanced?

### Solution

A balanced chemical equation has the same number of atoms of each element on both sides.

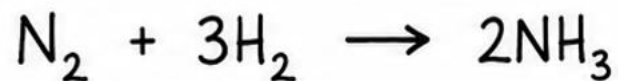
It follows the law of conservation of mass: matter is neither created nor destroyed in a chemical reaction.

Change coefficients to balance an equation, never the chemical formulae.

Exercise 5(a, b) — Translate these statements into balanced chemical equations.

(a) Hydrogen gas combines with nitrogen to form ammonia.

### Solution:



Check: N = 2 and H = 6 on each side.

(b) Hydrogen sulphide gas burns in air to give water and sulphur dioxide.

### Solution:



Check: H = 4, S = 2 and O = 6 on each side.

# WORD EQUATIONS TO FORMULAE

**Exercise 5(c,d)** — Translate the statements into balanced chemical equations.

(c) Barium chloride reacts with aluminium sulphate to give aluminium chloride and a precipitate of barium sulphate.

Solution



Barium sulphate is the insoluble white precipitate.

Check: Ba = 3, Cl = 6, Al = 2 and SO<sub>4</sub> groups = 3 on each side.

(d) Potassium metal reacts with water to give potassium hydroxide and hydrogen gas.

Solution



Check: K = 2, H = 4 and O = 2 on each side.

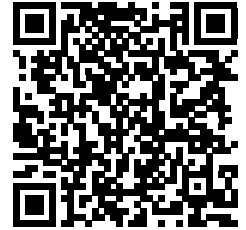


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