

Exercise walk-through

4.1

Introduction for Reactions

AP Chemistry

You must be able to

- spot evidence of a **chemical change** (gas, precipitate, color, temperature, light)
- distinguish a chemical change from a physical one
- link the evidence to new substances forming

1

The method

Method — Signs of a chemical reaction

A chemical reaction makes **new substances**. Common evidence:

- a **gas** is produced (bubbles);
- an insoluble **precipitate** forms;
- a **color change**;
- a **temperature change** (heat released or absorbed);
- light or a flame.

Exercises 2.1-2.3

2.1 List two signs that a chemical reaction has occurred. [2]

2.2 Cloudiness forms when two solutions mix. What has formed? [1]

2.3 Is dissolving sugar in water a chemical change? Give a reason. [2]

Exercises 2.1-2.3

2.1 List two signs that a chemical reaction has occurred. [2]

2.1

- Any two: gas produced, precipitate, color change, temperature change, light
-

2.2 Cloudiness forms when two solutions mix. What has formed? [1]

2.2

- A precipitate (an insoluble solid)
-

2.3 Is dissolving sugar in water a chemical change? Give a reason. [2]

2.3

- No – it is physical; the sugar keeps its identity and can be recovered by evaporation

Exercise 3.1

3.1 Which is the best evidence of a **chemical** reaction?

[1]

☐

A water evaporating

B a precipitate forming from two clear solutions

C ice melting

D sugar dissolving

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[1]

☐

A water evaporating

B a precipitate forming from two clear solutions

C ice melting

D sugar dissolving

3.1 B

- a precipitate forming is a new substance, evidence of a chemical reaction

Exercise 3.2 (a)

3.2 A student adds a metal to acid and observes bubbling and warming.

(a) State the two signs of a chemical reaction.

[2]

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(a) State the two signs of a chemical reaction.

[2]

(a)

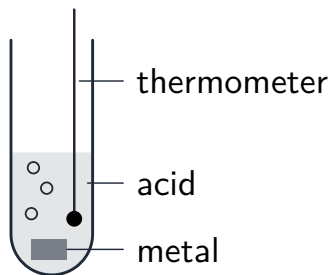
- Bubbling (gas produced) and warming (temperature change)

Exercise 3.2 (b)

3.2 A student adds a metal to acid and observes bubbling and warming.

(b) Explain why bubbling alone is not conclusive.

[1]

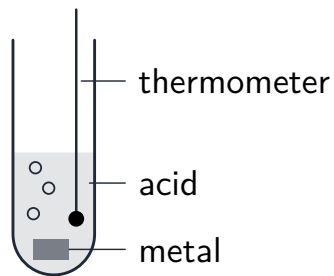


Exercise 3.2 (b)

3.2 A student adds a metal to acid and observes bubbling and warming.

(b) Explain why bubbling alone is not conclusive.

[1]



(b)

- Bubbling can also be physical (e.g. boiling), so it is not conclusive on its own

Exercise 3.3

3.3 Classify each as physical or chemical: (a) iron rusting, (b) crushing a can, (c) a firework exploding. [3]

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3.3

(a)

- chemical

(b)

- physical

(c)

- chemical