

Exercise walk-through

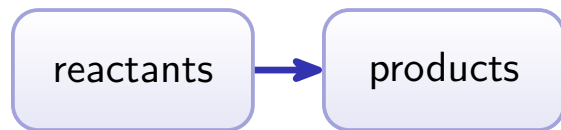
4.4

Physical and Chemical Changes

AP Chemistry

What we will cover

- 1 Recognizing a chemical reaction
- 2 Net ionic equations
- 3 Stoichiometry
- 4 Titration
- 5 Types of reactions
- 6 Acid-base reactions
- 7 Oxidation-reduction



Recognizing a chemical reaction

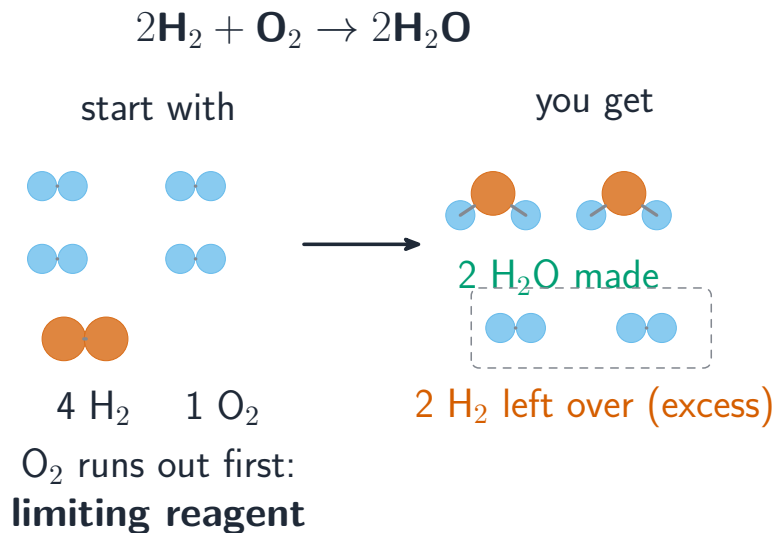
A **chemical reaction** rearranges atoms: old **bonds** break, new ones form – atoms are **conserved**.

A **chemical change** makes new substances; a **physical change** only moves molecules apart.



Evidence of reaction: heat, light, gas, solid

The limiting reactant runs out first and caps the product



The limiting reactant runs out first and decides how much product forms

Exercises 2.1-2.3

2.1 Classify melting ice as physical or chemical.

[1]

2.2 Classify iron rusting, with a reason.

[2]

2.3 What is the single best test for a chemical change?

[1]

Exercises 2.1-2.3

2.1 Classify melting ice as physical or chemical. [1]

2.1

- Physical
-

2.2 Classify iron rusting, with a reason. [2]

2.2

- Chemical – a new substance (iron oxide) forms
-

2.3 What is the single best test for a chemical change? [1]

2.3

- Whether new substances (with new properties) form

Exercise 3.1

3.1 Which is a **chemical** change?

[1]

☐

A boiling water

B dissolving salt

C burning paper

D breaking glass

Exercise 3.1

3.1 Which is a **chemical** change?

[1]

☐

A boiling water

B dissolving salt

C burning paper

D breaking glass

3.1 C

- burning paper forms new substances

Exercise 3.2 (a)

3.2 A student heats sugar until it turns black and gives off a smell.

(a) State whether this is physical or chemical.

[1]

Exercise 3.2 (a)

3.2 A student heats sugar until it turns black and gives off a smell.

(a) State whether this is physical or chemical.

[1]

(a)

- Chemical

Exercise 3.2 (b)

3.2 A student heats sugar until it turns black and gives off a smell.

(b) Justify your answer.

[2]

Exercise 3.2 (b)

3.2 A student heats sugar until it turns black and gives off a smell.

(b) Justify your answer.

[2]

(b)

- New substances form (the black solid and the smell are different materials), so it is a chemical change

Exercise 3.3

3.3 Classify each and give a one-word reason: (a) evaporating alcohol, (b) a battery discharging, (c) tearing paper. [3]

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3.3

(a)

- physical (state change)

(b)

- chemical (reaction)

(c)

- physical (shape)