

Solutions

Each answer shows the steps, then the **result**.

2.1

- a compound is **two or more elements chemically joined in a fixed ratio**

2.2

- a mixture is separated by **physical methods** (filtering, distillation)

3.1 B

- water is two elements chemically bonded — a **compound**
- A is an element molecule; C is a mixture; D is an element

3.2

(a)

- two different atoms always joined in pairs
- a **compound**

(b)

- two different atoms are present, **chemically bonded in a fixed ratio**

3.3

- compound: elements **chemically bonded**; need a **chemical reaction** to separate
- mixture: **not bonded**; separated by **physical means**

3.4

(a)

- **W: element** — only one type of atom
- **X: compound** — different atoms bonded in a fixed ratio
- **Y: mixture** — parts not chemically joined, so filtering works
- **Z: element** — cannot be broken down into anything simpler

(b)

- compound: atoms held by **chemical bonds** in a **fixed ratio**
- mixture: substances simply mixed, **any proportion**
- compound separated only by a **chemical reaction**
- mixture separated by **physical means** (filter, distil, magnet)

(c)

- appearance changes: grey-and-yellow mix → a single **black solid**
- heat is given out and the reaction continues without further heating
- the product has **different properties**, and the change cannot be reversed easily

(d)

- a **magnet**
- in the mixture the iron is still iron and is attracted; in iron sulfide the iron is **bonded**, so the compound is **not magnetic**