

Solutions

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

2.1

- Group I atoms have **one** outer-shell electron

2.2

- going down Group I, **reactivity increases**

2.3

- $2\text{K} + 2\text{H}_2\text{O} \rightarrow 2\text{KOH} + \text{H}_2$

2.4

- one more shell, so the outer electron is **further from the nucleus**
- more inner shells **shield** it
- it is held less strongly and **lost more easily**, so the metal is more reactive

2.5

- any **two** of: melts into a ball / moves quickly / fizzes rapidly / disappears / solution becomes alkaline

3.1 B

- melting point **decreases** down Group I
- A is the opposite; C and D are wrong

3.2

(a)

- rubidium is below potassium, so it is **more reactive**

(b)

- it has a **lower melting point** than potassium

3.3

(a)

- **sodium hydroxide** and **hydrogen**

(b)

- reactivity increases down the group, so potassium is **more reactive** than sodium

3.4

(a)

- lithium: fizzes steadily and moves slowly

- sodium: melts into a ball and fizzes rapidly
- potassium: melts, moves very fast, hydrogen ignites with a **lilac flame**

(b)

- indicator goes **purple** (or blue)
- a metal **hydroxide** (an alkali)

(c)

- $2\text{Li} + 2\text{H}_2\text{O} \rightarrow 2\text{LiOH} + \text{H}_2$

(d)

- potassium's outer electron is in a shell **further from the nucleus**
- it is **shielded** by more inner shells
- it is attracted less strongly and **lost more easily**

(e)

- any **two** of: reacts violently / melts / moves extremely fast / hydrogen ignites
- caesium is further down, so its outer electron is even more shielded and **lost most easily**