Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

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

2.1

Any two (1 mark each):

- it floats
- it fizzes (bubbles of gas)
- it melts into a ball
- it moves around on the surface

2.2

- correct formulae: $\mathrm{K + H_2O \rightarrow KOH + H_2}$
- balanced: $\mathrm{2K + 2H_2O \rightarrow 2KOH + H_2}$

2.3

- $10.5 \div 50.0 \times 100$
- **21**%

3.1

- potassium's outer electron is in a shell further from the nucleus
- there is more shielding by inner shells, so the attraction to the nucleus is weaker
- so the outer electron is lost more easily

3.2

- the solution turns from colourless to brown
- bromine is more reactive than iodine
- so bromine displaces iodine from potassium iodide

3.3

(a) $\mathrm{Cl_2 + 2Br^- \rightarrow 2Cl^- + Br_2}$; bromide ions are oxidised

(b) solid; less reactive than iodine; its atoms gain an electron less easily, as the outer shell is further from the nucleus

(c) points to include:

- push damp iron wool into the bottom of a measuring cylinder (or a graduated tube) (K)
- stand it upside down in a trough of water and record the starting volume of air (K)
- leave for about a week; the iron rusts and uses up the oxygen (K)
- water rises up the tube to replace the oxygen; record the final volume (K)
- percentage of oxygen = fall in volume ÷ starting volume ×100 (App)
- keep the temperature the same at the start and end, as gas volume changes with temperature (An)

Levels: **5–6** a full, logical answer with correct chemistry and correct terms; **3–4** several correct points, partly linked; **1–2** one or two relevant points.