

Mark schemes

Q1.

- | | | |
|-----|--|-------------|
| (a) | (A) pipette | 1 |
| | (B) conical flask | 1 |
| | (C) burette | 1 |
| (b) | methyl orange (solution)
or
phenolphthalein (solution)
<i>allow litmus (solution)</i>
<i>do not accept universal indicator</i> | 1 |
| (c) | colour change
<i>ignore clear</i> | 1 |
| (d) | any two from:
<ul style="list-style-type: none"> • swirl • add the acid drop by drop • read (burette) at eye level
<i>allow read (burette) at the bottom of the meniscus</i> • ensure no bubbles in burette • use a white tile • repeat and take a mean | 2 |
| (e) | 16.6 cm ³ | 1 |
| (f) | trial 2 and trial 3 | 1 |
| (g) | BaCl ₂ | 1 |
| | | [10] |

Q2.

(a)

Substance	Ion always produced in aqueous solution
	Cl ⁻
Acid	H ⁺
	Na ⁺
Alkali	OH ⁻
	SO ₄ ²⁻

do **not** accept more than **one** line from a box on the left

2

(b) alkaline

1

(c) pipette

1

(d) burette

1

(e) trial 3

1

(f) any **one** from:

- (hydrochloric acid) not added drop by drop
- did not swirl
- did not rinse apparatus (after previous trial)
- did not use a white tile
- misread pipette / burette

allow measured out too much alkali

1

(g) $\left(25.0 \text{ cm}^3 = \frac{25.0}{1000} =\right) 0.025 \text{ (dm}^3\text{)}$

1

(mass =) 0.025×4.00

*allow correct use of incorrect / no conversion of
volume*

1

= 0.1 (g)

1

alternative approach:

$\left(\text{concentration} = \frac{4.00}{1000} =\right)$

$$0.004 \text{ (g/cm}^3\text{)} (1)$$

$$(\text{mass} =) 0.004 \times 25.0 (1)$$

$$= 0.1 \text{ (g)} (1)$$

*allow correct use of incorrectly determined
concentration in g/cm³*

[10]

Q3.(a) **B**

1

(b) **C**

1

(c) zinc (oxide)

allow ZnO

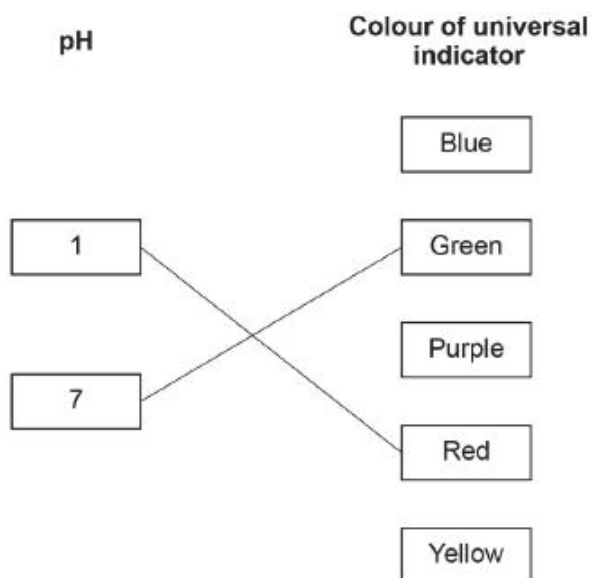
1

sulfuric (acid)

allow H₂SO₄

1

(d)



*do **not** accept more than one line from a box on the left*

2

(e) neutralisation

1

(f) burette

1

[8]