

# Acids, Bases and Salts

## Mark Scheme1

|                   |                          |
|-------------------|--------------------------|
| <b>Level</b>      | IGCSE                    |
| <b>Subject</b>    | Chemistry                |
| <b>Exam Board</b> | CIE                      |
| <b>Topic</b>      | Acids, Bases and Salts   |
| <b>Sub-Topic</b>  |                          |
| <b>Paper Type</b> | Alternative to Practical |
| <b>Booklet</b>    | Mark Scheme 1            |

**Time Allowed:** 58 minutes

**Score:** /48

**Percentage:** /100

| Question | Answer  | Marks |
|----------|---|-------|
| 1(a)     | In each column:<br>4 correct = [2]<br>3 correct = [1]<br><br>average temperature boxes completed correctly: 16, 27, 41, 50;<br>times completed in seconds correctly: 128, 58, 27, 18;                                 | 4     |
| 1(b)     | all points plotted correctly = [3]<br>smooth line graph;  | 4     |
| 1(c)     | value from graph: 12–13 s;<br>extrapolation;  | 2     |
| 1(d)(i)  | Expe 4;   | 1     |
| 1d)(ii)  | 2 from:<br>highest temperature;<br>more energy;<br>more (chance of) collisions;   | 2     |
| 1(e)(i)  | accurate;<br>than a measuring cylinder;   | 2     |
| Question | Answer  | Marks |
| 1(e)(ii) | in /use a lid; to reduce heat losses;<br>OR<br>repeats; average results;<br>OR<br>measure water or sulphuric acid or methyl orange using a burette/use a 2 d.p. stopwatch/digital thermometer; reference to accuracy; | 2     |

| Question | Answer  | Marks    | Guidance  |
|----------|---|----------|---|
| 2(a)     | 25, 27, 30, 32, 34, 36, 35, 34, 33<br>all 9 = 3 marks<br>8 = 2 marks<br>7 = 1 mark  | <b>3</b> | please put an 'x' by any incorrectly plotted points |
| 2(b)     | 25, 34, 41, 40, 39, 38, 37, 36, 34<br>all 9 = 3 marks<br>8 = 2 marks<br>7 = 1 mark  | <b>3</b> |   |
| 2(c)     | all 18 points plotted within half a small square = 3 marks<br>17 points plotted within half a small square = 2 marks<br>16 points plotted within half a small square = 1 mark;<br>smooth line graph;<br>labels; | <b>5</b> |   |
| 2(d)     | value read from graph, 38.5 °C;<br>indication clearly shown;  | <b>2</b> |   |
| 2(e)     | exotherm  | <b>1</b> |   |

| Question | Answer  | Marks | Guidance                        |
|----------|---|-------|---------------------------------|
| 2(f)     | to remove traces of acid A/clean;<br>to remove water;   | 2     |                                 |
| 2(g)(i)  | expe 2/acid B;  | 1     |                                 |
| 2(g)(ii) | acid B is stronger/dibasic/has a lower pH/more acidic;  | 1     | more reactive/more concentrated |
| 2(h)     | h losses/using a measuring cylinder/thermometer/cup not washed;<br>insulate/use burette/digital thermom./new cup; | 2     | 1 repeat and average            |

| Question | Answer   | Marks    | Guidance |
|----------|--|----------|----------|
| 3(a)     | whi<br>precipitate;<br>dissolves / clears;                   | <b>3</b> |          |
| 3(b)     | wh precipitate;  | <b>1</b> |          |
| 3(c)     | reaction / no change / no precipitate / colourless solution; | <b>1</b> |          |
| 3(d)     | wh<br>precipitate;   | <b>2</b> |          |
| 3(e)     | hydr / water;  | <b>1</b> |          |
| 3(f)     | a halide / not a named halide;                               | <b>1</b> |          |
| 3 g(i)   | /NH <sub>3</sub> ;   | <b>1</b> |          |
| 3g(i)    | /NH <sub>4</sub> <sup>+</sup> ;                              | <b>1</b> |          |