

Metals

Mark Scheme 2

Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Metals
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Mark Scheme 2

Time Allowed: 53 minutes

Score: /44

Percentage: /100

1 (a) Table of results

Initial temperature boxes correctly completed (2)	24 26 25 24 26	
Highest temperature boxes correctly completed (2)	39 37 35 31 29	[4]
Differences correctly completed (1)	15, 11, 10, 7, 3, allow ecf	[1]

(b) all 5 bars correctly drawn (2) - 1 for each incorrect

labelled in the centre (1)

correct scale (at least half the grid for 'y' axis) (1) [4]
 If plotting instead of bars only scale mark available

(c) exothermic/displacement/redox

not oxidation, reduction or neutralisation [1]

(d) (i) experiment 1/A [1]

(ii) sulfuric acid was most concentrated/strongest [1]

(e) (i) greater/higher ignore refe [1]

(ii) half the value/half the value from the table/lower or less [1]
allow 7.5 as a temperature change or 31.5 as a final temperature

(iii) more/larger volume of acid [1]

(f) one error source from:

heat losses/use of low accuracy measuring cylinders/magnesium pieces vary in
 length or mass [1]

2 Table of results

Experiment 1

initial and final volume boxes correctly completed (1), 0.0 and 26.0

Experiment 2

initial and final volume boxes correctly completed (2), 16.0 and 29.0

differences completed correctly (1), 26.0 and 13.0 [4]

(e) (i) Experiment 1 (1) [1]**(ii)** more in Experiment 1/greater volume (1) ×2 (1) [2]**(iii)** solution **A** more concentrated/stronger than **B** (1) X2 (1) [2]**(f)** twice the volume value for Experiment 2/26 (1) cm³ (1) [2]**(g)** change e.g. repeat titrations (1) or use a burette/pipette
explanation e.g. average reading more accurate (1) instead of m/cylinder [2]**(h) (i)** iron(II) ions present (1) [1]**(ii)** iron(III) ions (1) [1]**[Total: 15]**

3 Table of results

Experiment 1

final reading box correctly completed, 39.2 (1)

Experiment 2

final reading box correctly completed (1)

differences completed correctly, 39.2 (1) and 20.6 (1) [4]

(a) as an indicator owtte [1]

(b) (i) Experiment 1 (1) [1]

(ii) more in Experiment 1 / greater volume (1) [1]

(iii) solution **A** more concentrated / stronger than **B** (1) approx $\times 2$ (1) [2]

(c) 10.3 (1) $\text{ml}^3 / \text{ml} / \text{cc}$ (1) [2]

(d) change e.g. repeat titrations (1)

explanation e.g. average reading more accurate (1) [2]

[Total: 13]