

Stoichiometry

Mark Scheme

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

Time Allowed: 65 minutes

Score: /54

Percentage: /100

- 1 (a) no/little water present/little water implied (1) [1]
- (b) any value less than 7 (1) [1]
- (c) chromatography (1) apply to paper (1) use of solvent (1)
description of two yellow spots (1) [4]
paper in drink = max 2
- 2 volumes from syringe diagrams;
- 15, 45, 61, 73, 74, 80 and 80 all correct (4) (-1 for each incorrect) [4]
- (a) graph:
all points plotted correctly (3) (-1 for each incorrect)
smooth curve (1) [4]
- (b) volume of acid from graph, 10.5 → 11.5 (1) [1]
- (c) volume of hydrogen from graph, 29.5 → 30.5 (1) [1]

3 Table of results

initial temp.	24	23	24.5			
final temp.	-	20.5		14	11	7.5

All 11 temperatures recorded correctly (5), -1 for each incorrect (5)

(a) Graph points plotted correctly (3), -1 for each incorrect
straight line (1) (4)

(b) temperature from graph (1) e.g. $12.5^{\circ}\text{C} \pm 0.5$ (1)

indication (1) $^{\circ}\text{C}$ (1) (2)

(ii) temperature from graph (1) e.g. $4^{\circ}\text{C} \pm 0.5$
extrapolation shown (1) (2)

(c) endothermic (1) (1)

(d) temperature changes would be smaller (1)
more water (1) (2)

(e) larger surface area (1) reacts/dissolves faster/easier (1) (2)

(f) $22 - 24^{\circ}\text{C}$ /room temperature (1) reaction finished (1) (2)

(g) use a burette/pipette instead of measuring cylinder/insulation/lids/lags (1) (1)

- 4 (a) boxes completed to show stirrer / glass rod (1) [2]
watchglass / evaporating dish (1)
- (b) to speed up the reaction (1) [1]
- (c) correct answer 4.2 g (2) [2]
if incorrect, evidence of 17.8 – 13.6 (1)
- (d) (i) solid / lead oxide visible / remaining (1) [1]
do not allow: mention of precipitate
- (ii) filtration (1) [1]
- (iii) excess (1) [1]
allow: residue
- (e) Any **two** from: [2]
evaporation / steam (1)
solid / crystals formed (1)
breakdown / decomposition of solid (1)
- 5 measured volume of seawater (1)
using measuring cylinder (1)
into evaporating dish/beaker (1)
pre-weighed (1)
evaporate/heat (1)
to dryness/constant mass (1)
re-weigh (1)
indication of calculation method (1) max [6]
- would not work = max 0