

Experimental Techniques

Mark Scheme 1

Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Experimental Techniques
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Mark Scheme 1

Time Allowed: 54 minutes

Score: /45

Percentage: /100

Question	Answer	Marks	Guidance
1(a)	b line / origin clearly labelled on diagram;	1	
1(b)	any organic solvent / ethanol / alcohol / acetone;	1	water / acids
1(c)		1	
1(d)	1 and 3 present; 2 not present; unknown dye present;	3	1 reference to properties of dyes 1, 2 and 3
1(e)	rep the experiment / use a different solvent / measure R_f values;	1	

- 2 (a) thermometer (1)
- condenser (1)
- allow** condensing tube, condensating tube, etc. [2]
- (b) arrows labelled – water (in) and water (out) (1) [1]
- (c) fractional (1)
- distillation (1) [2]
- (d) ethanol (1) [1]
- (ii) temperature would rise (above 78°C) (1) [1]
- (e) alcohols are (in)flammable / catch fire / burn (1)
- ignore:** explode
- Bunsen burner / flame / heat (1) [2]
- 3 (a) precipitation / double decomposition (1) [1]
- allow:** ppt
- (b) low / insoluble / does not dissolve (1) [1]
- (ii) high / soluble / dissolves (1) [1]
- (c) filtration (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 (a) to prevent air / oxygen / bacteria entering jar (1) 11^J
- (b) pestle and / or mortar (1) 11^J
- (c) diagram of funnel and filter paper (1) labelled (1) [2]
- (d) yeast would not work at high temperatures/ kills yeast / denatures enzymes/ owtte (1) 11^J
allow: kills enzyme
- (e) (i) bubbles/ froth (1) 11^J
not: gas/ CO₂ given off/ turns cloudy
- (ii) (collect gas) and measure volume/ count bubbles (1)
over certain time interval (1) [2]
allow: one mark for timing until bubbles/ reaction stopped
- (f) fractional distillation (1) 11^J
- 6 mass of silica gel (1)
heat in oven > 100 °C (1)
for specified realistic time / until turns blue (1)
reweigh (1) record (1)
heat in oven again to check constant mass / indication of colour change (1)
calculation (1) max [6]