

GCSE CHEMISTRY

Topic Paper: 7.2.3 Alcohols & 7.2.4 Carboxylic acids
Part 1 & 2 Mark Scheme

MARK SCHEME

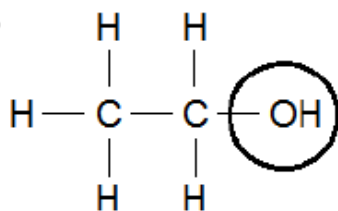


40 Marks



M1.

(a) (i)



1

(ii) ethanol

allow ethyl alcohol
*do **not** accept ethanal*
ignore all formulae

1

(b) (i) any **two** from:

lid
metal calorimeter
allow metal beaker
insulation (around sides of beaker)
*do **not** allow flammable insulation / beaker*
excluding draughts
stirrer
allow stirring

2

(ii) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should also apply a 'best-fit' approach to the marking.

0 marks

No relevant content

Level 1 (1–2 marks)

*There is a description of part of an experimental method **or** a measurement which should be taken.*

Level 2 (3–4 marks)

*There is a description of some parts of an experimental method **and** a measurement which should be taken.*

Level 3 (5–6 marks)

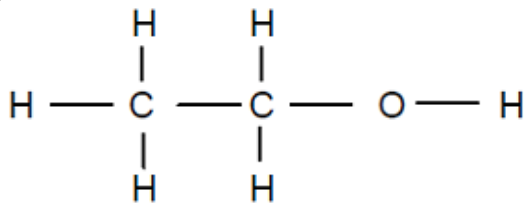
*There is a description of an experimental method **and** measurements which should be taken.*

Examples of the point that may be made in the response

light ethanol and heat water
extinguish ethanol
*after suitable temperature rise **or** after a suitable time*
stir water
measure mass / volume of water
measure initial temperature of water
measure final temperature of water
measure temperature rise
measure initial mass of ethanol (and burner)
measure final mass of ethanol (and burner)
measure change in mass of ethanol



M2. (a) (i)



allow other arrangements provided connectivity is correct

allow — OH

1

(ii) oxygen

accept O₂

allow O

1

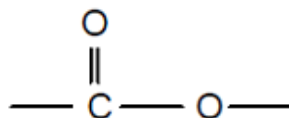
oxidation

allow oxidisation / oxidising / oxidised

allow redox

1

(b) (i) ring around



1

(ii) ester(s)

*do **not** allow ether(s)*

1

(iii) propanol

propanol accept propan-1-ol

allow propyl alcohol

1

[6]

M3. (a) Hydrogen / H⁺

ignore state symbols

ignore proton / H

1

(b) *it = weak acid*

pH of weak acid is higher than the pH of a strong acid

allow converse for strong acids

allow correct numerical comparison

1



any **one** from:

allow converse for strong acids

only partially dissociated (to form ions)

allow ionises less

not as many hydrogen ions (in the solution)

allow fewer H⁺ released

1

(c) (i) (titration of) weak acid and strong base

1

(ii) 0.61

correct answer with or without working gains 2 marks

if the answer is incorrect:

moles of sodium hydroxide = (30.5 × 0.5)/1000 = 0.01525 moles

or

(0.5 × 30.5/25) gains 1 mark

2

(d) 12

correct answer with or without working gains 2 marks or even with incorrect working.

if the answer is incorrect:

0.8 × 60 = 48g

or

evidence of dividing 48g (or ecf) by 4

or

$\frac{0.8 \times 250}{1000} = \frac{0.8}{4} = 0.8 \times 0.25 = 0.2 \text{ mol}$

or

evidence of multiplying 0.2mol (or ecf) by 60 would gain 1 mark

2

[8]

M4. (a) (i) C_nH_{2n+1}OH

1

(ii) OH

1

(b) (i) ethanol has only covalent bonds in its molecule

1

(ii) 3 (O₂)

1

3H₂O

1



- (c) (i) acidic 1
- (ii) an ester 1

[7]

- M5.** (a) (i) e.g. moles NaOH = moles of acid
or formula:

$$0.2 \times \frac{45}{1000} = 0.009$$

$$15M_1 = 0.2 \times 45$$

1

rounding to 0.01 loses mark

$$= 0.009 \times \frac{1000}{15} = 0.6(M)$$

$$M_1 = 0.6(M)$$

ecf for arithmetical error

correct answer 2 marks

1

- (ii) 36

ecf – (a)(i) ×60

correct answer 2 marks

0.6 ×60 gets 1 mark

relative formula mass of ethanoic acid

= 60 for 1 mark

0.6 ×incorrect molar mass gains second mark only

2

- (b) (i) A = hydrogen / H₂ 1

B = sodium hydroxide / NaOH or
sodium oxide / Na₂O

1

- (iii) C = ethyl ethanoate (acetate) /
CH₃COOC₂H₅ / CH₃CO₂C₂H₅ 1



(iv) D = (concentrated) sulphuric acid /
 H_2SO_4

*do **not** accept dilute sulphuric acid*

1

E = sodium ethanoate (acetate) / CH_3COONa / CH_3CO_2Na

1

[9]