Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Alcohols

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

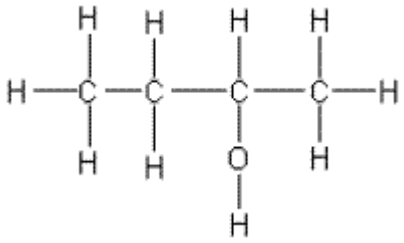
Mark Schemes

Q1.

(a) (i) Hexan-1-ol1
ONLY
1

(ii) Homologous (series)
ONLY
1

(iii) Displayed formula for butan-2-ol

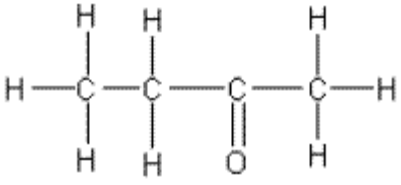


All bonds must be drawn out including the O–H bond
Ignore bond angles
1

(iv) $CH_3CH_2CH_2CH_2OH + [O] \longrightarrow CH_3CH_2CH_2CHO + H_2O$
Require this whole equation as written or formulae drawn out
Penalise "sticks"
1

(v) Displayed formula for butanone

(credit possible enols, ethers and cyclic structures for C_4H_8O)



All bonds must be drawn out
Ignore bond angles
1

(b) **M1** q = m c ΔT OR calculation 175 × 4.18 × 8

Downloaded from www.merit-minds.com

M2 = **5852** (J) OR 5.85 (kJ) OR 5.9 (kJ) (This also scores M1)

M3 0.005 mol, therefore ΔH = **–1170** (kJ mol^{-1})

OR ΔH = **–1170.4** (kJ mol^{-1})

OR ΔH = **–1200** (kJ mol^{-1})

Award full marks for correct answer

In M1, do not penalise incorrect cases in the formula

Ignore incorrect units in M2

Penalise M3 ONLY if correct answer but sign is incorrect OR value is in J mol^{-1}

If $m = 5 \times 10^{-3}$ OR if $\Delta T = 281$, CE and only allow one mark for correct mathematical formula for M1

If c = 4.81 (leads to 6734) penalise M2 ONLY and mark on for M3 = –1350 (–1347)

3

(c) (i) **M1** The enthalpy change (or heat change at constant pressure) when 1 mol of a compound/substance/alcohol

M2 is burned completely in oxygen

OR burned in excess oxygen

M3 with all reactants and products/all substances in standard states

OR

all reactants and products/all substances in normal states under standard conditions OR 100 kPa/1 bar and a specified T/298 K

For M3

Ignore reference to 1 atmosphere

3

(ii) **M1 (could be scored by a correct mathematical expression)**

M1 $\Delta H = \Sigma \Delta H_f$ (**products**) – .$\Sigma \Delta H_f$ (**reactants**)

OR a correct cycle of balanced equations

M2 = 4(–394) + 5(–286) – (–327)

(This also scores M1)

M3 = **– 2679** (kJ mol^{-1}) OR **–2680** (kJ mol^{-1})

Award 1 mark ONLY for (+) 2679 OR (+) 2680

Correct answer to calculation gains full credit

Credit 1 mark if + 2679 (kJ mol^{-1})

For other incorrect or incomplete answers, proceed as follows

- *check for an arithmetic error (AE), which is either a transposition error or an incorrect multiplication; this would score 2 marks (M1 and M2)*

Downloaded from www.merit-minds.com

- *If no AE, check for correct method; this requires either a correct cycle with $4CO_2$ and $5H_2O$ OR a clear statement of M1 which could be in words and scores <u>only M1</u>*

3

(d) (i) **M1 This is about the change in formula up the series**

Each alcohol in the series (compared with the previous one)

<u>increases by/has an extra CH_2</u>

OR

has <u>one more C-C and two more C-H</u>

M2 This is about the reaction and bond breaking/making

Combustion of each alcohol in the series <u>breaks one</u>

<u>more C-C and two more C-H</u> compared with the previous one <u>AND forms one more mol CO_2 and one more mol H_2O</u>

OR

A statement in which there is the idea that the <u>extra OR additional OR difference in number</u> of bonds <u>broken and formed</u> (as the series increases) <u>is the same</u> OR has <u>the same difference in energy</u>

N.B. If the first statement here for M2 is given, both marks score

2

(ii) **For the two marks M1 and M2**

<u>heat</u> loss or <u>heat</u> absorbed by the apparatus

OR

incomplete combustion/not completely burned

OR

The idea that the water may end up in the gaseous state (rather than liquid) OR reactants and/or products may not be in standard states.

2

[18]

Downloaded from www.merit-minds.com