Level 2 Chemistry: practice paper 2026

AS 91165 Demonstrate understanding of the properties of selected organic compounds · Vertex Academy practice paper, not an NZQA paper

Attempt ALL the questions. Show ALL working. Write your answers on lined paper, or in the space under each question.

QUESTION ONE

(a) Name each compound:
(i) $CH_3CH_2CH_2OH$ (ii) $CH_3CH(OH)CH_3$ (iii) CH_3CH_2COOH (iv) $CH_3CHClCH_3$
State whether each of the two alcohols is primary or secondary.

(b) Pentane, C_5H_{12}, has three structural isomers.
Give the condensed structural formula and the name of each isomer.

(c) But-2-ene, $CH_3CH=CHCH_3$, has geometric (cis and trans) isomers, but but-1-ene, $CH_2=CHCH_2CH_3$, does not.
Describe the two geometric isomers of but-2-ene and explain why but-1-ene has none.

(d) When 2-chlorobutane, $CH_3CHClCH_2CH_3$, is heated with potassium hydroxide dissolved in ethanol, three different alkenes form.
Discuss this reaction: name the type of reaction and the three products, explain why there are three, and identify the major product.

QUESTION TWO

(a) Ethene, $CH_2=CH_2$, is bubbled through orange bromine water.
Describe what you would observe, name the organic product and name the type of reaction.

(b) Ethanol is heated with acidified potassium dichromate, H^+ and $Cr_2O_7^{2-}$.
Describe the colour change, name the organic product and name the type of reaction.

(c) Propene, $CH_3CH=CH_2$, reacts with hydrogen bromide, HBr, to form two products.
Name both products, identify the major product, and explain why it is the major product.

(d) Three unlabelled bottles hold hexane, hex-1-ene and hexan-1-ol. You have bromine water and acidified potassium dichromate.
Discuss how you would identify each liquid, giving the observations, the organic products and the types of reaction.

QUESTION THREE

(a) The table gives the boiling points and solubility in water of five alcohols.
Describe how the boiling point and the solubility in water change as the carbon chain gets longer.

Alcohol	Boiling point (°C)	Solubility in water
methanol	65	all proportions
ethanol	78	all proportions
propan-1-ol	97	all proportions
butan-1-ol	118	about 7 g per 100 mL
pentan-1-ol	138	about 2 g per 100 mL

(b) Propene, $CH_3CH=CH_2$, is made into polypropene for food containers.
Name the type of polymerisation, and describe the repeating unit of polypropene.

(c) Ethanoic acid, CH_3COOH, reacts with sodium carbonate solution, Na_2CO_3. A 0.1 mol L^{-1} solution of ethanoic acid in water has a pH of about 3.
Describe what you would observe with sodium carbonate, write equations for the reactions of ethanoic acid with sodium carbonate and with water, and explain why the pH is about 3 rather than 1.

(d) Solutions of ethanoic acid, ethanol and methanamine, CH_3NH_2, are tested with red and blue litmus paper.
Discuss the results, using equations for any reactions with water, and describe the reaction of methanamine with hydrochloric acid.

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