**NCEA past exam questions on reaction schemes**

**2017**

Complete the following reaction scheme by drawing the structural formulae of both organic compounds **A**

and **B**, as well as the major and minor products **C** and **D**.

Identify both reagents 1 and 2, and indicate the type of reaction occurring at each step.



**2016**

(a) Complete the following reaction scheme by drawing organic structures for **S1** to **S7**, and identifying reagents **1** to **3**.



(b) Draw a reaction scheme to show the conversion of **butan-1-ol** to **butan-2-one**.

You should include any relevant reagents, conditions required, and the structures of all organic substances involved.

**2015**

Complete the following reaction scheme by drawing the structural formulae of the organic compounds **A**

to **E**, and identifying reagents **1** to **5**.



**2014**

Propene can be reacted with water in the presence of acid to form a major product (**A**) and a minor

product (**B**).

• **A** is oxidised to form product **C**.

• **B** is oxidised to form product **D**.

• When **D** is reacted with SOCl2, it forms product **E**.

• When **D** is reacted with alcohol **B**, it forms an **ester G**.

• When **D** is reacted with alcohol **A**, it forms **ester H**, which is an isomer of **G**.

• When **E** is reacted with alcoholic ammonia, it forms product **F**.

• When **E** is reacted with water, it forms product **D**.

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**2013**

Complete the following reaction scheme by drawing the structural formulae of the organic compounds

**B** and **C**, and identifying reagent **1**.

Include any necessary conditions, needed to bring about the transformation from reactant **A** to the organic compound **C**, which is a **base**.



**2012**

1.Alcohol **A**, (C4H10O) can react with Cr2O72– / H+ to give compound **B** which does **not** react with Tollens’ reagent. Compound **A** also reacts with SOCl2 to give a haloalkane **C**, which when reacted with alcoholic KOH, gives two products, **D** and **E**, which are not geometric isomers. When **E** reacts with H+ / H2O, **A** is the product. When **D** reacts with H+ / H2O, two products are formed, **A** and **F**. **F** can be oxidised to form butanoic acid.

**2.** The haloalkane 1-chlorobutane can be used to make butanamide. One of the intermediate products is a

carboxylic acid. Show, using structural formulae, how this might be achieved in a number of reaction steps.

Include all reagents.

**2011**

Complete the following reaction scheme by naming and drawing the structural formula of each of the compounds **A** to **F**.

Identify the reagents **1** to **4**, including any necessary conditions, needed to bring about each transformation.

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**2010**

1. The haloalkane, 2-chloro-2-methylbutane, can be prepared by reacting 2-methylbutan-2-ol with concentrated HCl.

(a) (i) Write an equation for this reaction using structural formulae.

(ii) State the type of reaction occurring, and give a reason for your answer.

**2.** Complete the following reaction pathways by drawing structural formulae for Products A to E and, in the shaded boxes, identifying the reagents ***1*** to ***5*** (including any necessary conditions) needed to bring about each transformation. 

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**2009**

Complete the reaction scheme by giving the formulae for reagents 1 to 4 and the **structural formulae** for the organic products A to D.

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**2008**

Complete the following reaction scheme by giving the formulae for reagents 1 to 5 and the **structural formulae** for the THREE organic products.

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