Types of organic reactions

**2019**

1. (a) Explain how acidified potassium permanganate solution, KMnO4 / H+(*aq*), can be used to distinguish

between compounds A (alkene) and B(alkane).

In your answer you should

• identify the type of reaction

• describe any relevant observations.

(b) Compounds **A** and **B** will both react with bromine water, Br2(*aq*).

Compare and contrast these reactions by referring to the conditions required, the observations, the products

formed, and the type of reaction.

**2.** Compare and contrast the reaction that forms compound **B** to the reverse reaction that forms propene, C3H6, from compound **B**.

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**2018**

Reacting 2-chloropropane with potassium hydroxide, KOH, can produce different products due to different

reactions occurring.

Elaborate on the reactions of 2-chloropropane with potassium hydroxide, KOH.

In your answer you should:

• identify the conditions of the reagent KOH

• explain the types of reaction that occur with the reagent in each condition

• draw structural formulae of the organic products.

**2017**

Alkanes and alkenes can be identified by their reactions with a solution of bromine water, Br2(*aq)*.

Contrast the types of reactions an alkane and an alkene will undergo with an orange solution of bromine water.

**2015**

Ethene, C2H4(*g*), reacts with aqueous potassium permanganate solution, KMnO4(*aq*), dilute acid, H2O / H+, and hydrogen bromide, HBr.

Compare and contrast the reactions of ethene gas with each of these three reagents.

In your answer, you should:

• describe any observations that can be made

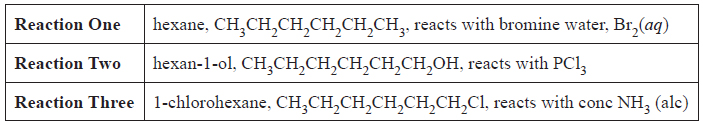
• identify, with reasons, the type of reaction ethene undergoes with each reagent

• describe the functional group of the products formed

• include equations showing the structural formulae for the organic compounds for each reaction.

**2014**

**1.** The reactions shown below are all classified as being the same type of reaction.



Compare and contrast these reactions.

In your answer you should:

• state whether any conditions are required

• describe the type of reaction occurring and explain why all three reactions are classified as this type of

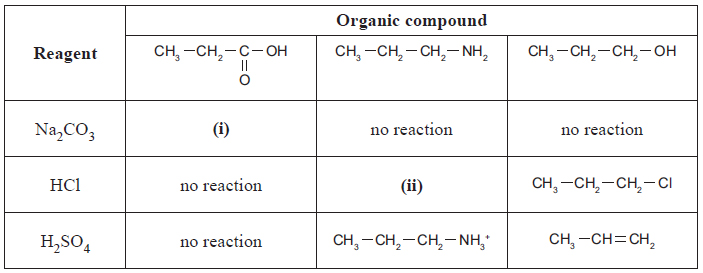
reaction

• explain why two layers form in **Reaction One**.

**2.** Sodium carbonate, hydrochloric acid, and sulfuric acid are each added to separate samples of three

organic compounds.

The structures of the compounds and the products of any reactions are given in the table below.



Compare and contrast the reactions that **do** occur between these organic compounds, and the reagents in the

table above.

In your answer you should:

• give the structure of the organic products **(i)** and **(ii)**

• describe the different types of reactions occurring, and give reasons why they are classified as that type

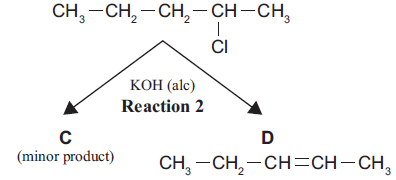
• identify any specific conditions that are required for the reactions to occur.

**3. i)** Explain why **Reaction 1** from the reaction scheme, shown again below, is classified as an addition reaction.

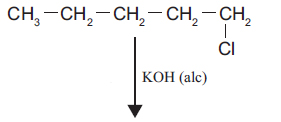
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**ii)** Explain why the reaction shown below, is classified as an elimination reaction.



**iii)** The reaction belowis also an elimination reaction. Draw the structural formula of the product formed



**2013**

Butan-1-ol can react separately with each of PCl5, Cr2O72–/ H+, and concentrated H2SO4.

Elaborate on the reactions of butan-1-ol with each of the three reagents.

For each reaction, your answer should include:

the type of reaction occurring and the reason why it is classified as that type

the name of the functional group formed in each product

the structural formula of the **organic** product.

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