SUBJECT GCE Chemistry MD — Year 12 LP 5

This half term: Skills, Knowledge and Understanding to be developed:

- **Skills (students WILL BE ABLE to by the end of the Learning Programme:** develop their experimental skills through carrying out identification tests for functional groups and separation by distillation.
- **Knowledge (students WILL KNOW by the end of the Learning Programme):** the bonding in ethene; the mechanism for photochlorination of methane; the mechanism of electrophilic addition of alkenens; the mechanism for nucleophilic substitution of halogenoalkanes;
- **Understanding (students WILL DEMONSTRATE their understanding) through:** applying knowledge learnt to answer examination questions.

Key Terms / Words: distillation, reflux, nucleophilic substitution, carbocation, electrophilic addition.

LP 5 – Weeks 1 & 2 Learning Outcomes:

- Students will understand what is meant by sigma bonds exemplified by C-C and C-H bonds in alkanes.
- Students will describe and understand the C=C bond in ethene and other alkenes as comprising pi bond and sigma bond.
- Students will know the difference in reactivity between alkanes and alkenes in terms of the C=C bond as a region of high electron density.
- Students will understand the mechanism of radical substitution, such as the photochlorination of alkanes.

Students will apply and demonstrate new knowledge and skills in CDG assessment

Independent study hour: Students will be completing:

Assessment

CDG

MARK

Success criteria:

1. To be able to write a mechanism for the photochlorination of alkanes.

Homework LP 5 1/3

1. Revise for CDG on 2.4

LP 5 – Weeks 3 & 4 Learning Outcomes:

- Students will understand E–Z isomerism in terms of restricted rotation about a carbon-carbon double bond.
- Students will know the mechanism of electrophilic addition, such as in the addition of Br_2 to ethene, as a characteristic reaction of alkenes.
- Students will know the orientation of the normal addition of HBr to propene in terms of the relative stabilities of the possible carbocations involved.
- Students will know the conditions required for the catalytic hydrogenation of ethene and the relevance of this reaction.
- Students will know the orientation of the normal addition of HBr to propene in terms of the relative stabilities of the possible carbocations involved.
- Students will know the conditions required for the catalytic hydrogenation of ethene and the relevance of this reaction.
- Students will know the industrial preparation of ethanol from ethene.

Students will apply and demonstrate new knowledge and skills in CDG assessment

Independent study hour: Students will be completing:

Assessment

CDG

MARK

Success criteria:

1. To be able to identify the main product from electrophilic addition of alkenes and to be able to recall the mechanism.
2. To be able to apply the mechanism to different alkenes.
3. To be able to interpret tabulated data to explain the main factor which affects the ease of nucleophilic substitution of halogenoalkanes.

Homework LP 5 2/3

1. Revise for CDG on 2.5

LP 5 – Weeks 5 & 6 Learning Outcomes:

- Students will understand how the elimination reaction of halogenoalkanes forms alkenes, for example, HBr eliminated from 1-bromopropane to form propene.
- Students will understand the mechanism of nucleophilic substitution, such as in the reaction between $OH^-(aq)$ and primary halogenoalkanes.
- Students will understand the effect of bond polarity and bond enthalpy on the ease of substitution of halogenoalkanes.
- Students will know the hydrolysis/$Ag^+_{(aq)}$ test for halogenoalkanes.

Independent study hour: Students will be completing:

Success criteria:

Homework LP 5 3/3

LP 5 – Week 7 Learning Outcomes: o Students will know the preparation of ethanol and other alcohols by fermentation followed by distillation, and issues relating to the use of biofuels. o Students will know the dehydration reactions of alcohols. o Students will understand the classification of alcohols as primary, secondary and tertiary o Students will know the oxidation of primary alcohols to aldehydes/carboxylic acids and secondary alcohols to ketones. o Students will know and carry out a dichromate(VI) test for primary/secondary alcohols and sodium hydrogencarbonate test for carboxylic acids		1. To be able to write balanced equations for the reactions of alcohols. 2. To be able to distinguish alcohols by their reactions with acidified dichromate. 3. To be able to identify carboxylic acids by their reaction with carbonates and hydrogencarbonates.	