EXPERIMENT 4

REACTION OF ALIPHATIC AND AROMATIC HYDROCARBONS

Course Learning Outcome:

Solve chemistry related problems by applying basic concepts and principles in physical and organic chemistry. (C4, PLO4, CTPS3, MQF LOD6)

Learning Outcomes:

At the end of this lesson, students will be able to:

i. study the chemical properties of an alkane, alkene and arene
ii. differentiate an alkane from an alkene and arene.

Student Learning Time:

Face-to-face	Non face-to-face
1 hour	1 hour

Introduction

1. What is hydrocarbon?

   Organic compounds containing _____ and _____ atoms.

2. What is the difference between saturated and unsaturated hydrocarbons?

   Saturated hydrocarbon is a compound in which all hydrogen and carbon atoms are bonded together with _____. Unsaturated hydrocarbon contains at least one _____ or _____ bonds between the carbon atoms.

3. State the distinguishing feature of aromatic hydrocarbons.

   An aromatic hydrocarbon or arene is a _____ with sigma bonds and delocalised _____ between carbons atoms.

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4. State the type of reaction for bromination of alkane, alkene and arene.

   Alkane – _____

   Alkene – _____

   Arene – _____

Procedure

List down all precautions of the experiment:

i. Make sure to keep the bromine under the_____. The Br_2 fumes can irritate the throat and sinuses. If bromine is spilled on the skin, flood the area with water for 10 minutes.

ii. Cyclohexane and cyclohexene are _____ compounds. Ignite the compounds in the_____.

(A) <u>Reaction with bromine in dichloromethane</u>

1. What is the purpose of bromine test?

   To differentiate _____ and _____ hydrocarbon.

2. Why must certain test tubes be fully covered with black sugar paper?

   Even a small exposure to light will initiate the formation of _____

(B) <u>Oxidation with $KMnO_4$</u>

What is the colour of $KMnO_4$ solution and state its function?

The colour of $KMnO_4$ solution is _____. It is used as an

_____

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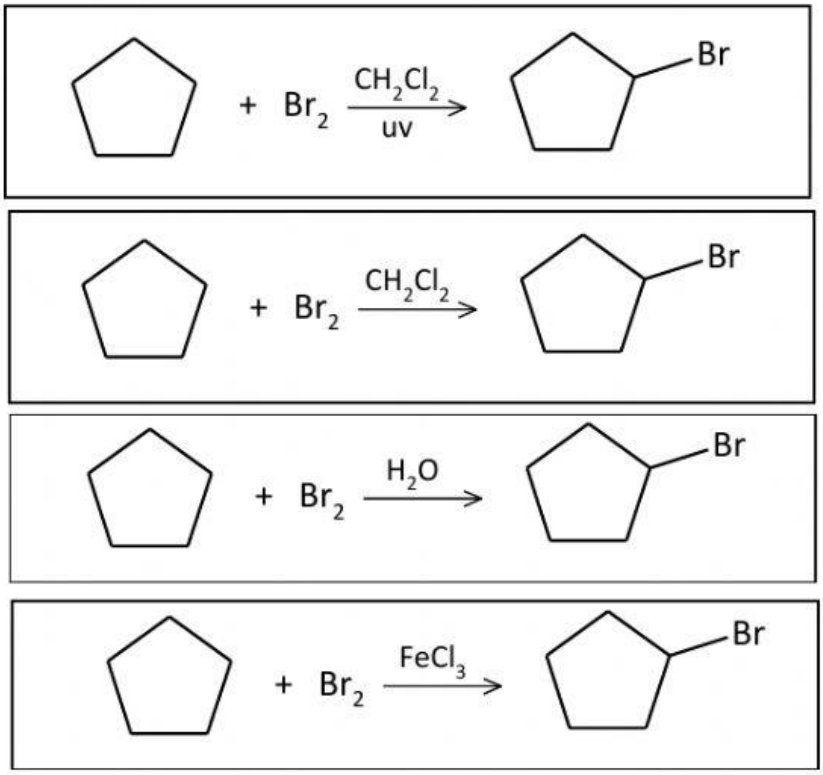
Experiment 4 : Data Analysis

(A) <u>Reaction with bromine in dichloromethane</u>

1. Which of the chemical equation for the bromination of ;

   i. cyclopentane in the presence of sunlight.



   ii. cyclopentene.

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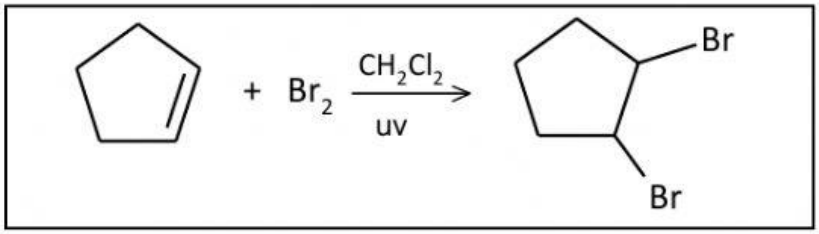

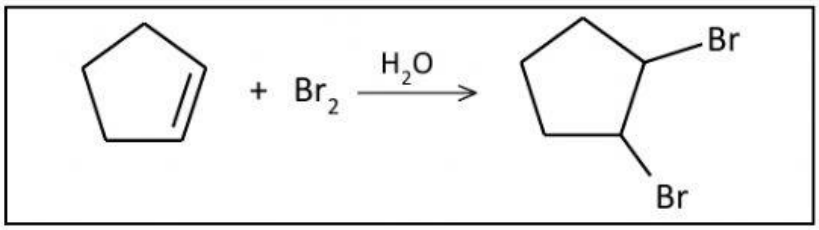

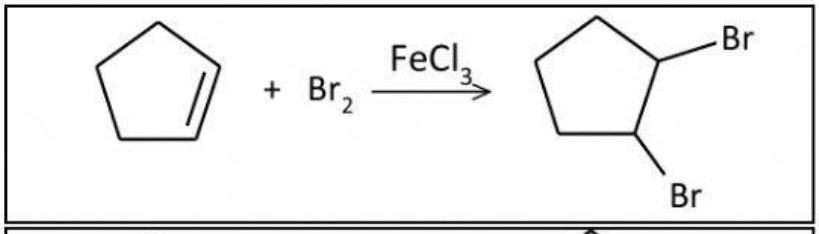

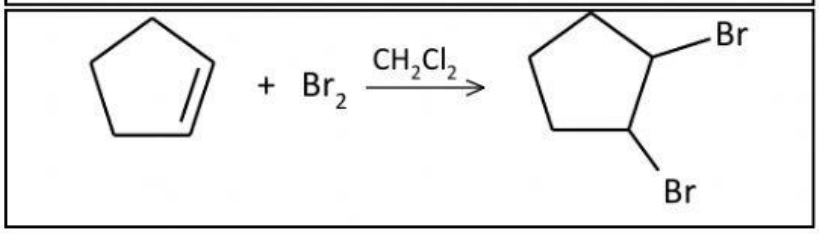

2. State the type of reaction for 1(i) and 1(ii).

   1(i) : _____

   1 (ii) : _____

3. State the function of sunlight .

   provide energy for _____ cleavage of halogens

(B) <u>Oxidation with $KMnO_4$</u>

1. Which of the chemical equation for the oxidation of the following compound with hot acidified $KMnO_4$.

   i. cyclopentene

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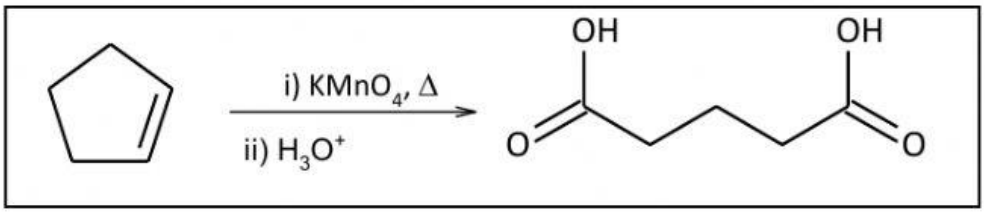

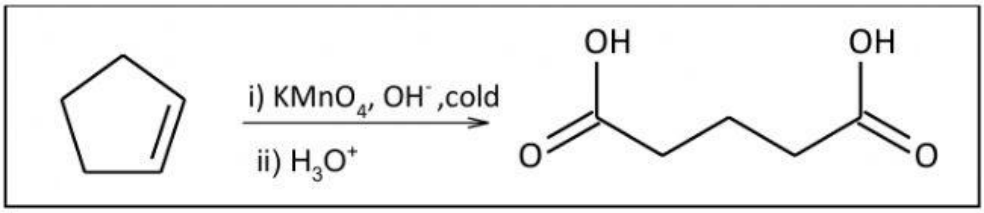

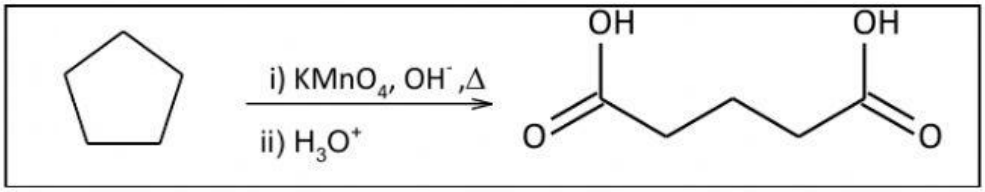

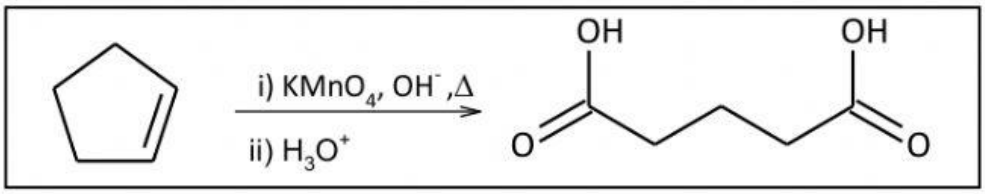

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