
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.

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 Br₂ 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) Reaction with bromine in dichloromethane

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) Oxidation with KMnO₄

What is the colour of KMnO₄ solution and state its function?

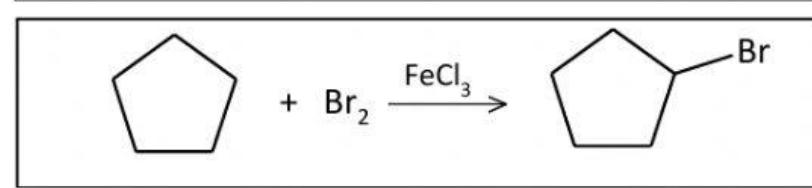
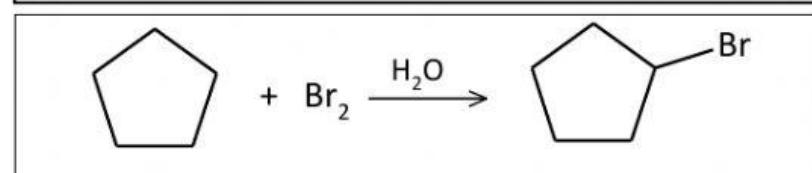
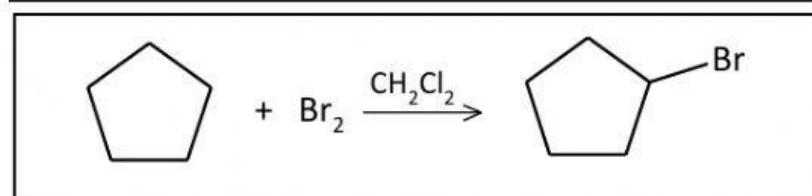
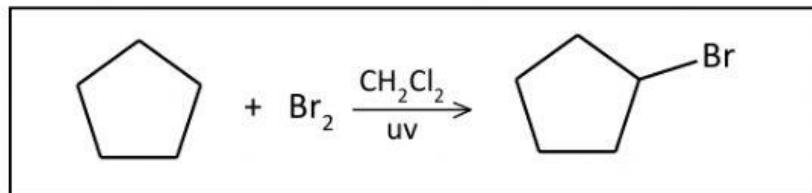
The colour of KMnO₄ solution is _____ . It is used as an _____

Experiment 4 : Data Analysis

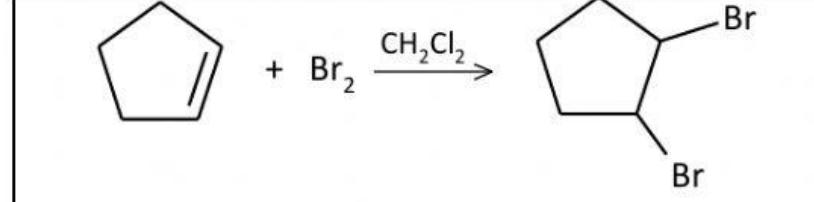
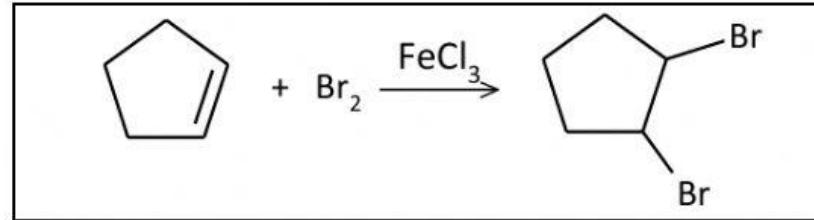
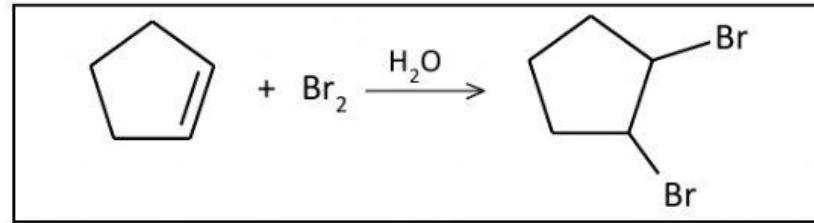
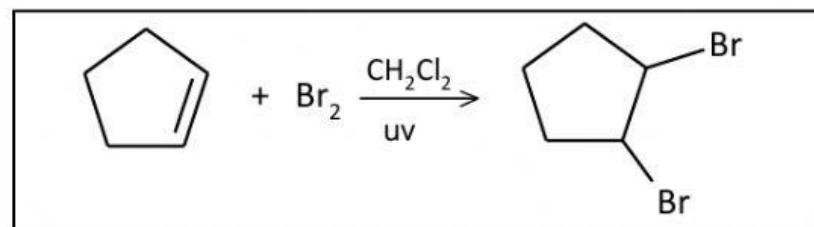
(A) Reaction with bromine in dichloromethane

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

i. cyclopentane in the presence of sunlight.



ii. cyclopentene.



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) Oxidation with KMnO_4

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

i. cyclopentene

