

## Lab: Reactions of Saturated and Unsaturated Hydrocarbons

### Objectives:

- ▶ To compare and contrast the difference in reactivity between some simple hydrocarbons.
- ▶ To relate the difference in reactivity between the hydrocarbons to the single and multiple bonds found in the compounds.

### Introduction:

Hydrocarbons are those compounds containing hydrogen and carbon only.

Alkanes and cycloalkanes are called saturated hydrocarbons because their molecules are made up single bonds only, i.e.  $\sigma$ -bonds, and the compounds are generally quite unreactive towards oxidizing agents or even concentrated sulphuric acid.

Alkenes and cycloalkenes are unsaturated hydrocarbons because they contain carbon-carbon double or triple bonds, i.e.  $\pi$ -bonds, which are very reactive sites. Thus, atoms or groups can be added across the double or triple bonds to form saturated compounds.

### Your Task:

Form a hypothesis to account for the difference in reactivity of a saturated hydrocarbon and an unsaturated hydrocarbon. Decide on possible reactions that you may perform, stating clearly the observations that you expect to make in the experiments. State the products of your reactions and give plausible explanations for all your expectations.

You will be provided with the following materials:

Hydrocarbons

$\text{KMnO}_{4(\text{aq})}$

$\text{Br}_{2(\text{aq})}$