

CHEMISTRY STUDY MATERIALS FOR CLASS 10

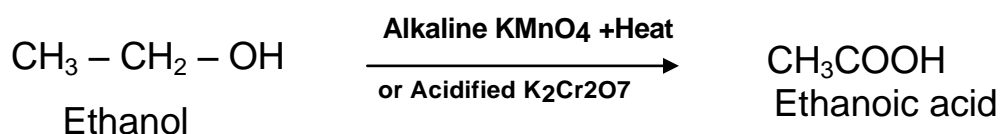
(Based on NCERT: Carbon and its compounds)

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DATE:- 13/07/2020

OXIDATION

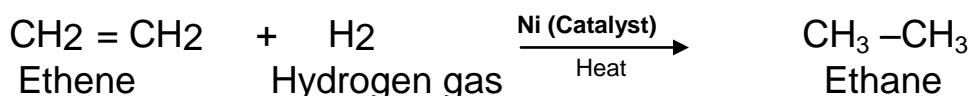
- Carbon compounds can be oxidised.
- Alcohols on oxidation are converted to carboxylic acids.
- Alkaline KMnO_4 or acidified $\text{K}_2\text{Cr}_2\text{O}_7$ are used as oxidising agents.



ADDITION REACTION

- This reaction occurs only in unsaturated compounds, where there are double or triple bonds.
- The addition of hydrogen to an unsaturated hydrocarbon to obtain a saturated hydrocarbon is called hydrogenation.

For example: Ethene, on heating with hydrogen, in the presence of a nickel or palladium catalyst forms ethane.

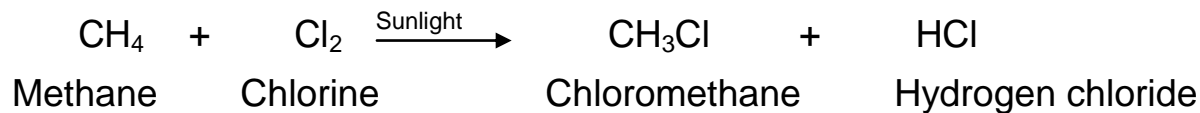


- The process of hydrogenation is used in industries to prepare vegetable ghee (or vanaspati ghee) from vegetable oils.

SUBSTITUTION REACTION

- The reaction in which one or more hydrogen atoms of a hydrocarbon are replaced by atoms of other elements is called a substitution reaction.
- Substitution reactions are a characteristic property of saturated hydrocarbons.

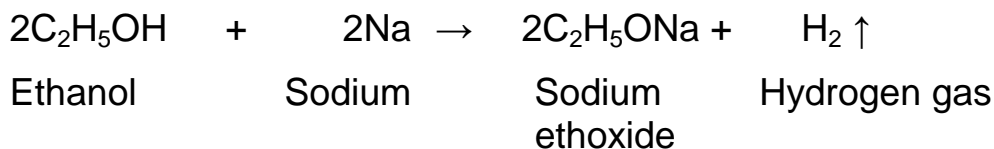
For example: Methane reacts with chlorine in the presence of sunlight to form chloromethane and hydrogen chloride.



Some Important Carbon Compounds – Ethanol & Ethanoic Acid

Properties of Alcohols

- **Reaction with Sodium:** Sodium reacts steadily with ethanol to form sodium ethoxide along with the evolution of hydrogen gas.

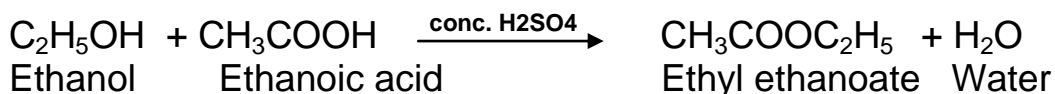


Dehydration: Ethanol, on heating with excess of conc. H_2SO_4 at 170°C gets dehydrated to form ethene.

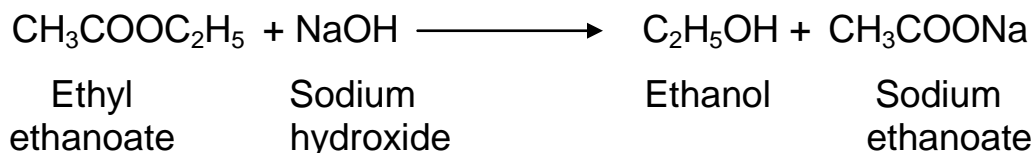


Properties of Ethanoic acid/ Acetic acid

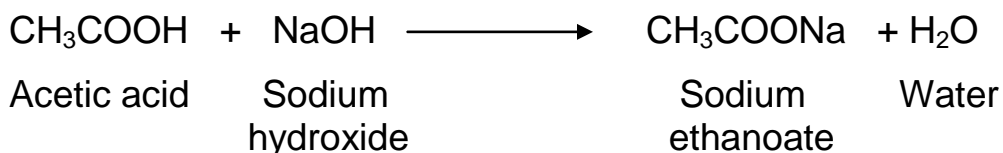
- **Esterification:** Ethanoic acid reacts with alcohols in the presence of a little conc. sulphuric acid to form esters.



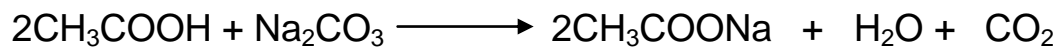
The ester, on treating with a base such as NaOH is converted back to alcohol and sodium salt of carboxylic acid. This reaction is known as Saponification because it is used in the manufacture of soap.



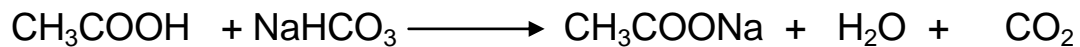
- **Reaction with a base:** Ethanoic acid reacts with a base such as sodium hydroxide to form a salt and water.



- **Reaction with Carbonates & bicarbonates:** Acetic acid reacts with carbonates and bicarbonates to form salt, water and carbon dioxide.



Acetic Sodium Sodium Water Carbon
acid carbonate acetate dioxide gas



Acetic Sodium Sodium Water Carbon
acid bicarbonate acetate dioxide gas
