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### Synthetic Fibres

Synthetic fibres are a class of molecules known as macromolecules which form polymers.

**Characteristics**

1. Durability
2. Elasticity
3. Easy to wash
4. Easy to mend

**Uses**

Commonly chemical treatment of wool yarns. Suitable for all of them used.

**Properties**

Wool treated with chemicals to make synthetic fibres.

**Preparation**

Can be made by many ways.

**European Textiles**

Wool treated with chemicals to make synthetic fibres.

**Properties**

Wool treated with chemicals to make synthetic fibres.

### Alcohols

Alcohol is an organic compound in which a hydroxyl group (-OH) is bonded to a carbon atom in a single bond (alcohol group).

Common names and IUPAC names of some alcohols:

Common Name	IUPAC Name
Methyl alcohol	Methanol
Propyl alcohol	Propan-1-ol
Isopropyl alcohol	Propan-2-ol
Butyl alcohol	Butan-1-ol
tert-Butyl alcohol	2-Methylpropan-2-ol

**Preparation**

1. From Alkenes: Reaction of alkenes with water in presence of acid produces alcohols.
2. Reduction of Aldehydes and Ketones:  $RCHO + H_2 \rightarrow RCH_2OH$
3. Reduction of Carboxylic Acids:  $RCOOH + H_2 \rightarrow RCH_2OH$

**Uses**

- As Alcoholic Beverages
- As Solvents
- As Disinfectants
- As Antiseptics
- As Fuel

### Esters

Esters are sweet smelling chemical compounds, derived from an alcohol and a carboxylic acid.

**General Formula**

$$R-CO-O-R'$$

**Nomenclature**

1. Name the alkyl part from the alcohol.

2. Name the acid with the -oate suffix.

**Some Common Esters**

Name	Formula	Uses
Ethyl acetate	$CH_3COOC_2H_5$	Flavouring agent
Amyl acetate	$CH_3COOC_5H_{11}$	Flavouring agent
Propyl acetate	$CH_3COOC_3H_7$	Flavouring agent
Butyl acetate	$CH_3COOC_4H_9$	Flavouring agent
Hexyl acetate	$CH_3COOC_6H_{13}$	Flavouring agent
Octyl acetate	$CH_3COOC_8H_{17}$	Flavouring agent
Dodecyl acetate	$CH_3COOC_{12}H_{25}$	Flavouring agent

**Preparation**

Reaction of carboxylic acid with alcohol in presence of a few drops of concentrated sulphuric acid produces esters.

$$R-COOH + R'-OH \xrightarrow{H_2SO_4} R-COOR' + H_2O$$

**Applications of Esters**

- As Solvents
- As Disinfectants
- As Antiseptics
- As Fuel

### Magnetism

The force that attracts magnets is called magnetism.

**Earth's Magnetic Field**

The Earth acts as a magnet. It has a magnetic field around it.

**Artificial Magnet**

Magnets made by artificial means are called artificial magnets.

**Natural Magnet**

Magnets found in nature are called natural magnets.

**Types of Artificial Magnets**

- Bar Magnet
- Disc Magnet
- Sheet Magnet
- Electromagnet

**Temporary and Permanent Magnets**

Magnets that lose their magnetism when the current is switched off are called temporary magnets.

Magnets that retain their magnetism for a long time are called permanent magnets.

**Uses of Magnets**

- In Compass
- In Electric Bell
- In Loudspeaker
- In Motor
- In Generator

**North Pole**

The end of a magnet which attracts the south pole of another magnet is called the north pole.

**South Pole**

The end of a magnet which attracts the north pole of another magnet is called the south pole.

**Neutral Axis of Magnet**

The imaginary line passing through the two poles of a magnet is called the neutral axis.

**Magnetic Field**

The region around a magnet in which its magnetic force can be felt is called the magnetic field.

### Refraction of Light Through Lenses

Refraction of light is the bending of light when it passes from one medium to another.

**Concave Lens**

A lens which is thinner in the middle and thicker at the edges is called a concave lens.

**Convex Lens**

A lens which is thicker in the middle and thinner at the edges is called a convex lens.

**Image Formation by Concave Lens**

Concave lens always forms a virtual, erect, and diminished image.

**Image Formation by Convex Lens**

Convex lens can form both real and virtual images.

**Uses of Lenses**

- In Spectacles
- In Camera
- In Microscope
- In Telescope
- In Projector
- In Magnifying Glass