

Rochelle salt is used in devices like microphones, strain gauges, phonograph pickups and SONAR devices.

In optical communication, the ferroelectric crystals are used for optical modulation.

Ferro electric materials are used to produce ultrasonics

Electrets are also used to bond the fractured bones in human body. 10.They are used as frequency stabilizers and crystal controlled oscillators.

10 APPLICATIONS OF DIELECTRIC MATERIALS

The dielectric materials have three major applications.

It is used as a dielectric medium in capacitors.

It is used as insulating materials in transformers.

It is used in industries and dielectric heating.

10.1 Dielectrics in Capacitors

If dielectrics, to be used in capacitors, it should posse the following properties.

Properties

It must have high dielectric constant

It should posses high dielectric strength

It should also have low dielectric loss.

Applications

Thin sheets of papers filled with synthetic oils are used as dielectrics in the capacitors.

Tissue papers and poly propylene films filled with dielectrol are used in power capacitors.

Mica is used as dielectrics in discrete capacitors.

An electrolytic solution of sodium phosphare is used in wet type electrolytic capacitors.

10.2 Insulating materials in transformers

If dielectrics to act as insulating materials, it should possess the following properties.

Properties

It should have low dielectric constant

It should possess low dielectric loss

It must have high resistance

It must possess high dielectric strength

It should have adequate chemical stability

It must have high moisture resistance

Applications

PVC (Poly Vinyl Chloride) is used to manufacture pipes, batteries, cables etc.

Liquid dielectrics such as petroleum oils, silicone oils are widely used in transformers, circuit breakers etc.

Synthetic oils such as askarels, sovol, etc., are used as a coolant and insulant in high voltage transformers.

Gases such as nitrogen, sulphur hexa fluoride are used in x-ray tubes, switches, high voltage gas filled pressure cables, coolants respectively.

Industrial application

Dielectrics possessing piezoelectric effect is used in gas lighters, microphones, phonographs.

Dielectrics possessing inverse Piezo electric effect is used in quartz watchers, ultrasonic dryers, cleaning the semiconducting wafers, ultrasonic transducer etc.

Dielectric Heating

Dielectric heating is the process of heating the insulating materials at a very high voltage under suitable frequency at which dielectric loss becomes maximum, so that the dielectric loss will come out in the form of heat. Hence adequate heating was done at high voltages.

Dielectric heating is the principle used in microwave oven.

Dielectric heating is also used in the dehydration of food, tobacco etc.