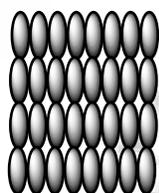


LIQUID CRYSTAL

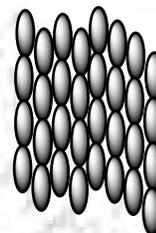
Liquid crystal is the state between liquid and those of solid crystals. Liquid crystals may flow like a liquid but its molecules may be oriented as crystal.

Classification of Liquid Crystals – Liquid Crystals are divided into following parts –

NEMATIC LIQUID CRYSTALS – The word nematic derived from Greek language which means thread like. Nematic liquid crystals have well arranged molecules and show the properties of crystals like refractive index, dielectric constant, electrical conductivity, etc. In nematic liquid crystals the molecular points are vertically arranged without any order of horizontal arrangement.

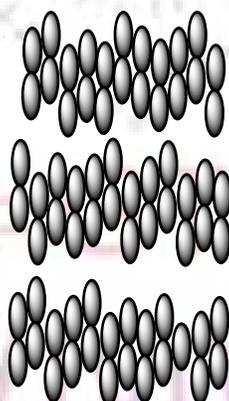


CRYSTALLINE STATE



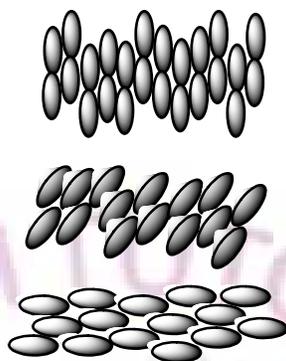
NEMATIC LIQUID CRYSTAL

SMECTIC LIQUID CRYSTALS – The word nematic also comes from Greek language which means soapy, grease like material. In smectic liquid crystal the molecules are arranged side by side in a series of layers. These layers free to slip over each other, therefore, smectic liquid crystals have soapy feelings.



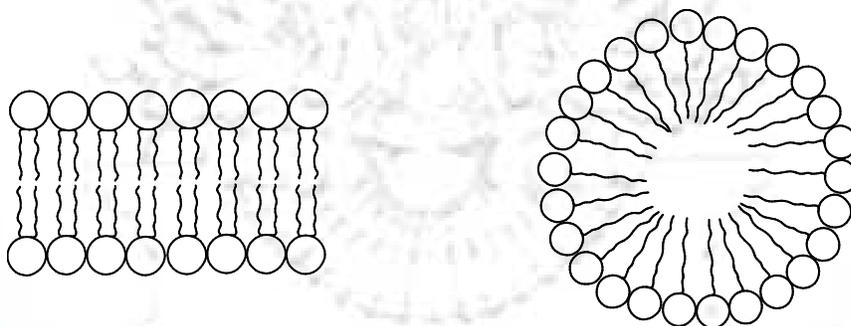
SMECTIC LIQUID CRYSTAL

CHOLESTERIC LIQUID CRYSTAL – The molecular structure of these liquid crystals looks like cholesterol, so they are called cholesteric liquid crystal. The molecules in cholesteric liquid crystals are arranged in layers but the alignment of molecules is not parallel.



CHOLESTERIC LIQUID CRYSTAL

LYOTROPIC LIQUID CRYSTALS – Lyotropic crystals are behaved like liquid crystals when mixed with water. In lyotropic liquid crystals the one end of the molecule polar and other end is non-polar. Polar ends attract water molecules and non-polar end hydrocarbons. At low concentration they look like simple molecules but at high concentration they are arranged themselves in a pattern and form micelles.



MICELLE

APPLICATIONS OF LIQUID CRYSTALS

- (1) Liquid crystals are used as solvent for the study of structure of molecules spectroscopically.
- (2) Liquid crystals are used in digital displays like pocket calculators, wrist watches etc.
- (3) Liquid crystals are also used in TVs (liquid crystal display).
- (4) Liquid crystals are used in gas liquid chromatography.
- (5) Liquid crystals are used in detecting tumors in the body by thermography.

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