ABSRACT

Now a day the physically distinct independent existence of a physical state; viz. liquid crystalline state, like solid, liquid and gas is fully accepted. However, study of liquid crystals must concern itself with chemistry, physics, biology, engineering etc. New applications of liquid crystals in various fields also induce synthetic variations in compounds which exhibit desired properties in new mesogens. Applications have attracted many scientists and technologists in the field of liquid crystal research work. Several physicists and chemists are trying to study unique properties of liquid crystal and synthesis of novel substances respectively and study from all possible angles like physical, chemical, analytical etc. They are also trying to explore newer technique and applications which yield better economical results.

The survey concluded that the structural geometry of the molecules has been recognized as the main factor for the exhibition of liquid crystallinity. Various research workers have prepared several mesogenic homologous series with changing molecular geometry or substituent’s and their positions or central part to cause variations in molecular rigidity and flexibility for desired application. Liquid crystalline properties may be modified in varying manner if the core structure remains intact, while, specific changes are brought about in the moieties.

The investigation of present study can be divided into two main categories.

Category-I: Synthesis of novel homologous series of liquid crystalline properties.

Category-II: To study the effect of molecular structure on liquid crystalline properties.

The study may support in understanding the subject as well as to find new aims and objects for research. The following points are the main features of the object in view.

(1) To synthesize new homologous series of mesogens by varying the alkyl chain length of n-alkoxy left terminally attached groups keeping rest of the molecular part unchanged. Thus the prime and foremost aim set forth for this investigation is to synthesize new homologous series with a potential of exhibiting mesomorphism.

(2) Homologous series with unexplored central group –CH=CH-CO-, -COO- and –CO-CH=CH- as a central bridge and –OR as well as –OCH3, -NO2, -H, -Cl terminal group proposed to be synthesized.
(3) The study aims discerning unobserved transitions if any, by investigating the homologous series under analytical observation.

(4) The study of mixed mesomorphism is aimed getting to determine the texture of mesomorphic state.

(5) To correlate molecular structure with reference to its shape, size, length, width, polarity, polarizability as a consequence of molecular rigidity and flexibility will have to be discussed.

(6) Finally, the aim is fixed to explore on the ‘probability’ basis if the current work under present investigation which may find applications and may become productive.

A balancive approach will be adopted to fulfill aims and objects through college laboratory and external agencies wherever required for the work due to inadequate facilities at the college laboratory. Thus, study may depend on the courtesy of outside agencies. However study will be tried to match with the present trend on the subject and to keep up the standards of research as high as possible.