OBJECT of THIS INVESTIGATION

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In a nematic liquid crystalline state which is endowed with a domain structure, the long rod-shaped molecules having more or less translational freedom but only restricted rotational freedom, lie parallel to one another in the given domain. There exists a definite orientation of molecules in this condition.

If any other substance is dissolved in such a mesomorphic liquid, the dissolved substance will be in an anisotropic medium and its physical and chemical properties are likely to be affected to a considerable extent. Mixed liquid crystals should be expected to be obtained.

During the past years, some investigations were carried out on mixed liquid crystals, but it seems that in almost all such studies, the views as well as interpretations that accrued from these were predominantly based on phase rule and phase rule applications. Very little work appears to have been done on the mode of formation of mixed liquid crystals and the extent to which such a formation can take place.

Recently such an attempt was made and the effect of polarity of the terminal groups on the mode of and extent to the formation of mixed liquid crystals has been interpreted in terms of the slope of the transition lines. Different

values have been calculated and an order of group efficiency has been deduced. However, evidences that link up the structural and other chemical factors which affect such a formation of mixed liquid crystals seem to be relatively less or scanty.

It was therefore, considered necessary and interesting to carry on the study further in order to bring in the picture the effect of the groups of different polarities and length which might throw further light on the subject. From this point of view, several binary systems have been examined during the course of this investigation.

Still more scanty is the evidence on the mixed liquid crystal formation in mixtures of non-liquid crystalline substances. Therefore, a number of binary systems have been studied, where both the components are non-liquid crystalline substances, with a view to arrive at some conclusions regarding the factors that influence the appearance of mesomorphism in such mixtures.

Besides, it was thought that a study of mixed liquid crystals in general, will throw some more light on the existing data, enhancing its own value and helping in drawing some conclusions of interest.

Hence, the present investigation was undertaken.