

SUMMARY

The mesomorphic property of the α -substituted-trans-p-n-alkoxycinnamic acid have been studied in this work. It is found that α -phenyl- and α -ethyl-trans-p-n-alkoxycinnamic acids exhibit no mesomorphism. The reason is that the α -phenyl ring does not lie in the molecular axis, whereas the α -ethyl group causes the steric effect on the molecular packing and the length to width ratio is not suitable to form mesophases. The α -methyl-trans-p-n-alkoxycinnamic acids show the mesomorphic property except the first two members in the series. This is because their molecules are not long enough, so the length to width ratio is not suitable to form the mesomorphic phases.

The phase behavior of both pure and binary mixtures of the α -methyl-trans-p-n-alkoxycinnamic and 6-n-alkoxy-2-naphthoic acids were studied by microscopic observation and DSC technique. The systematic phase diagrams of the binary systems of these two series, in which the alkoxy chain lengths are different by 1 unit, are compared to those of trans-p-n-alkoxycinnamic acids in Chansangtong's work. The phase diagrams of α -methyl-trans-p-n-alkoxycinnamic acids do not appear similar to those of trans-p-n-alkoxycinnamic acids, while those of the 6-n-alkoxy-2-naphthoic acids do. If we consider the molecular structure, we can see that

6-n-alkoxy-2-naphthoic acids have a shape similar to that of trans-
p-n-alkoxycinnamic acids with the same alkyl groups, whereas in
the α -methyl-trans-p-n-alkoxycinnamic acids, the molecules are
wider. So we suggest that the molecules, which are of similar
shape, will have the same phase behavior.

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