

DIELECTRIC PROPERTIES OF NEMATIC LIQUID
CRYSTAL MODIFIED WITH DIAMOND
NANOPARTICLES

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S u m m a r y

In the present study, the influence of diamond nanoparticles (DNPs) on dielectric properties of nematic liquid crystal (LC) E7 from Merck has been considered. It is established that the insertion of DNPs leads to an increase in the dielectric constant ε' , as well as to a significant change in the electric conductivity σ of the LC. The growth of ε' with the concentration of DNPs, C_{DNP} , is mainly caused by a contribution of the DNP permittivity to the effective permittivity of the composite. The character of the $\sigma(C_{\text{DNP}})$ curves depends on the ionic purity of LC E7: for the samples based on pure E7, an increase of the electric conductivity with the concentration of DNPs is detected, whereas the reverse trend is observed for the samples containing impure E7. This behavior is attributed to the competitive adsorption and desorption of ions on/from the surface of DNPs and the ion transfer along the percolation network of these particles.