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Physical Processes Affecting the Electrical Conductivity of Liquid Crystals[1] DAVID WEBB, YURIY GARBOVSKIY, Central Connecticut State University — Both display and non-display applications of thermotropic liquid crystals rely on an applied electric field influencing the orientation of anisotropic molecules. Small quantities of ions are typically present in liquid crystals and can alter the effect of the electric field. For example, a common screening effect can occur where the electric field induced by the ions diminishes the strength of the applied electric field. Therefore, an understanding of ion-related effects in liquid crystals is critical for the development of advanced liquid crystal devices. Measuring DC conductivity yields important information about the effect of ions on the behavior of molecular liquid crystals. An interpretation of the DC electrical conductivity data requires reasonable approximations. As a rule, a single type of dominant ions or two symmetric ions of the same mobility are assumed. In this presentation, the effects of several types of ions (characterized by different values of their mobility and interacting with substrates) on the measured DC electrical conductivity of liquid crystals are discussed. The substrates of the liquid crystal cell and their important role in ionic processes is also considered. .

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