RESEARCH TREND OF LIQUID CRYSTAL DISPLAY

Young-jae Jeon
Department of Chemistry, Konkuk University, Seoul 143-701

LCD(Liquid Crystal Display) is a display device using the liquid crystal. Its possible to be operated at low electricity with low voltage multiplex. Due to these merits, it applies to many products such as LC-TV, LC-projector, portable computer, watch, game machine, electronic appliances, screen of indicator and so on. LCD is derived at first from the developments of DS (Dynamic Scattering)-mode in 1968 and TN-FEM(Twist Nematic Field Effect Mode) in 1971. However, it was impossible to make a stable display at that time with those modes. The way out by TN mode was introduced STN(Super-twisted Nematic)-LCD mode. However, view angle, contrast, and switching speed and so on in this mode need to be developed. While, TFT(Thin Film Transistor) mode as a multiplex method, in which an active matrix addresses to a matrix one by one, has been studied. TFT-LCD complemented with view angle of TN-LCD; STN switching speed and contrast has been rapidly developed with the growth of semiconductor technology and became a main item of LCD confronting CRT. On the other hand, F(Ferroelectric)-LCD and AF(Antiferroelectric)-LCD by duty multiplex method has been also studied. Despite many efforts, a large flat panel display utilizing FLC seems to be still of no practical use. Recently reflective color display using Cholesteric mode and Guest-Host mode been reported. However, in both cases, it was difficult to obtain bright high contrast full color images.

PDLCD(Polmer Dispersed liquid Crystal Display) is a new type of LCD, it consists of liquid crystal and polmer, but its novel multilayer structure can reflect light at a specific wavelength and transmit light at other wavelengths. Furthermore, the reflection intensity can be controlled electrically. Because this device doesn't need polarizer or color filter, very little light is lost and it should provide bright color images.