

Fast-Switching Surface-Stabilized Polyimide Layer Using New Alkyl-free Bifunctional Mesogenic Monomer

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Liquid crystal displays (LCDs) with high contrast ratio and low power consumption present high-resolution images. Vertical alignment (VA) is extensively applied to display devices among several types of LC modes. However, the VA mode includes two-step orientation motion of LC molecules when applying voltage and it makes rising response time slow. To improve slow rising response problem, photoreactive monomer (RM) that offers advantage of fast rising response time in LC media have been studied. In this paper, we fabricated new fast-switching surface-stabilized polyimide layer using alkyl-free bifunctional mesogenic monomer. This new photoreactive vertical alignment layers induce pre-tilt of LC molecules by ultraviolet (UV) exposure. Proposed alkyl-free bifunctional monomer with methacrylate groups is photopolymerized by UV and provide a pre-tilt of LC molecules. The alignment properties were confirmed through the polarizing optical microscope, and electro-optical characteristics by the voltage-transmittance curve and the response time measurement.