



Development and Industrialization of Liquid Crystal Materials

Haruyoshi TAKATSU

The development and industrialization of some liquid crystal materials are reviewed. Examples given are of fluorinated esters for TN, tolans, alkenyls, cyclohexenes and azines for STN, polymer dispersed liquid crystals and UV curable liquid crystals, and fluorinated liquid crystals of fused ring systems for TFT. The current research on new fluorinated naphthalenes with negative dielectric anisotropy for VA and the recycling of liquid crystals for TFT are also described.

Keywords : Nematic, Polymer Dispersed Liquid Crystal, UV Curable Liquid Crystal, Fused Ring, Recycle

Development of LC Alignment Materials

Kiyoshi SAWAHATA

Polyimide as alignment materials for various LCDs have been developed and are widely used for LCD mass productions. Depending on the type of LCD, such as TN, STN, TFT and other new LCDs, the required properties and optimized structure of polyimide are various. This review focuses on material design in order to obtain good LC alignment, pretilt and good electrical properties of the LC cell. In addition, various type of optical alignment materials are also described.

Keywords : LCD, Polyimide, Alignment, Pretilt, Voltage Holding Ratio, VHR, Residual DC Voltage, RDC, Image Sticking, Optical Alignment, Photo-Alignment

Phase Transition Behavior of Thermotropic Cubic Mesogens Under Pressure

Yoji MAEDA

The effect of pressure on the phase behavior of two optically isotropic, thermotropic cubic mesogens, 4'-*n*-hexadecyloxy-3'-nitrobiphenyl-4-carboxylic acid and 1, 2-bis-(4-*n*-octyloxy- or 4-*n*-decyloxy-benzoyl)hydrazine, was reviewed from the experimental point of

view, especially at the triple point of the SmC, cubic, and third phases, indicating the upper limit of pressure for the cubic phase. The *T* vs. *P* phase diagrams for the three mesogens were constructed.

Keywords : Thermotropic Cubic Mesogen, In-Situ Texture Observation, Cubic-SmC Transition, Triple Point

Combinatorial Chemistry and Its Application to the Synthesis of Liquid Crystals

Takayuki DOI, Kumiko OGINO and Takashi TAKAHASHI

The concept of combinatorial chemistry and how it is utilized in organic synthesis, i. e. parallel synthesis and split & mix synthesis in the solid phase are described. Recent reports for the synthesis of liquid crystalline compounds utilizing a combinatorial method are discussed.

Keywords : Combinatorial Chemistry, Library, Banana-Shaped Liquid Crystal, Rod-Like Liquid Crystal, Heterocycles

Development of Active Matrix Electrophoretic Displays for Handheld Devices

Masaru YASUI

Safe and healthy displays that offer portability such as a notebooks and paper-like readability in a thin and light-weight form are the holy grail of the display industry. The expectation for such a promising display has been realized by the progressing technology of electrophoretic in combination with a-Si TFT back-plane that has become mature technology today. The products are aimed at high-end PDA type electronic books, the display format is SVGA, and the size is 6" diagonal. The newest driving scheme has to be developed to control such bi-stable characteristics. However there are still many remaining problems to be solved. Such types of displays leads to different types of applications compar-

ed to the conventional displays e.g. mobile printers or battery driven copy machines. The wide viewing angle, the high reflectivity, high contrast ratio and the ultra-low power display module has been achieved. An opportunity to be evaluated in the real market field is now

available. We also report in this paper the short-and the medium-term technology forecast for electrophoretic displays.

Keywords : Electronic Paper, Electrophoretic, Electronic Ink, Micro Capsule, Electronic Book
