

Table of Contents

Preface and Committee

I. Physics of Liquid Crystals

Rolic® LCMO Photo Alignment Technology: Mechanism and Application to Large LCD Panels M. Ibn-Elhaj, S. Chappellet and F. Lincker	3
Anomalous Large Bend Elastic Constant and Faster Electro-Optic Response in Soft Glassy Gels Formed by a Dipeptide G.G. Nair and R. Bhargavi	14
Phase Diagram of Thermotropic Liquid Crystal Including Negative Pressure Region Generated in Metal Berthelot Tube K. Hiro and T. Wada	22
A Novel Method for Measuring the Difference in Flexoelectric Coefficients of Nematic Liquid Crystals B.I. Outram and S.J. Elston	26
Deep-Blue Photoluminescent Properties of a Liquid Crystal TB10A Q.L. Ma, R. Xiong and Y.M. Huang	33
Crystal Morphology and Thermal Properties of PTT/POE/OMMT Nanocomposites M.T. Run, Q.C. Zhang, W. Zhou and Y. Zhong	39
Experimental Investigations on Ultrasonic Velocity and Behavior of Thermodynamic Parameters of Four Members of nO.m Series D.M. Latha, V.G.K.M. Pisipati, M.R.N. Rao and P.V.D. Prasad	43
Synthesis and Characterization of a Novel Liquid Crystalline Polymer Bearing Azobenzene X.D. Tang, Y. Chen, X. Wang, F.Q. Yu and M.S. Pei	47
Simulation of Nematic Liquid Crystalline Polymer for Out-of-Plane Case S.F. Fu, Q. Zhang and Q.H. Li	51
Phase Morphology and Rheology Behaviors of PTT/POE/OMMT Nanocomposites M.T. Run, Z.Y. Qi, M. Yao, W. Zhou and B.T. Xing	55
Supramolecular Assembly of Binary Block Copolymers of PEO-b-PMAA and PEO-b-PMZO Y. Chen, T.S. Wang, F.Q. Yu, X.D. Tang and M.S. Pei	59
Effects of the Heat Treatment on the Mechanical Properties of a Novel Thermotropic Liquid-Crystalline Polymer Fiber W.B. Zhu, H.X. Gan, Y.Y. Zhuang, W.M. Qin, Y.P. Wang and Y.M. Wang	63
Dilatometric Study on Phase Transitions of Benzylidene-p-n-hexadecyl /Hexadecyloxy Anilines (5.O16, 5O.O16 and 5.16) M.R.N. Rao, P.V.D. Prasad, D.M. Latha and V.G.K.M. Pisipati	67
Study of Blue-Phase III–Isotropic Phase Transition R.Z. Wang, J.J. Liu and H.L. Li	71
Optical Study of Orientational Order Parameter in p-n-(Phenyl Benzylidene) -p-Alkyl and Alkyloxy Anilines B.R. Rajeswari, P. Pardhasaradhi, M.R.N. Rao, P.V.D. Prasad, D.M. Latha and V.G.K.M. Pisipati	75
Viewing Angle Measurement of Polymer-Dispersed Liquid Crystal X.F. Jiang and S.X. Wu	79
Polarizing Optical Microscopic Characterization of Nematic Liquid Crystal Confined in Porous Silicon Y.M. Huang, Q.L. Ma and B.G. Zhai	83
Novel pH-Responsive Triply Hydrophilic Block Copolymer with Reversible Micellization Property X.D. Tang, Y. Chen, F.Q. Yu and M.S. Pei	88
Study of Variation in Order Parameter with Temperature of Mixtures of Nematic and Cholesteryl Liquid Crystal S. Hasware, R. Parekh, A. Devlekar and S.M. Bhatia	92

Blue Fluorescent Liquid Crystal N-(4-methoxybenzylidene)-4-n-alkoxybenzenamine Q.L. Ma, B.G. Zhai, R. Xiong and Y.M. Huang	96
An Optical Study on Orientational Order Parameter and Molecular Polarizability in Benzylidene Anilines M.R.N. Rao, P.V.D. Prasad, V.G.K.M. Pisipati and D.M. Latha	102
Study of Infrared Imaging System Based on Liquid-Crystal Thermo-Optic Effect Y. Zhang, C.L. Cai, X.L. Niu and W.G. Liu	106
Optical Properties and Electronic Structures of a Liquid Crystal TBO10A Y.M. Huang, Q.L. Ma and B.G. Zhai	110
Phase Transition, Birefringence and Orientational Order Parameter Studies in Four Members of Benzylidene Aniline Liquid Crystals P.V.D. Prasad, G.P. Rani and V.G.K.M. Pisipati	115

II. Chemistry of Liquid Crystals

Synthesis and Mesophase Properties of a Series of Chiral Rod-Like Polysiloxanes H. Wu, C.X. Zhang, J.L. Pu, Y.N. Li, M.X. Zhang and G.S. Fang	123
Synthesis of Conjugated Polythiophenes with Azobenzene Substitutes in the Side Chains X.D. Tang, T.S. Wang, Y. Chen, F.Q. Yu and M.S. Pei	127
Synthesis and Property of Liquid Crystal Polymers Containing Photosensitive Groups J.L. Li, W.M. Zhang, Y.L. Zhao and J.L. Pu	131
Synthesis and Characterizations of a Rod-Like Liquid Crystal TBO16A Q.L. Ma, B.G. Zhai, R. Xiong and Y.M. Huang	135
Synthesis and Mesophase Study on a Triphenylene-Based Polysiloxane C.X. Zhang, J.L. Pu, H. Wu, A. Zhang, M.X. Zhang and G.S. Fang	139
Synthesis and Characterization of Schiff's Base Compounds with Octadecylaniline as End Group M.V.V.N. Reddy, P.V.D. Prasad, K. Fakruddin, R.J. Kumar, D.M. Latha and V.G.K.M. Pisipati	143
Hexabenzocoronene with Swallow-Tailed Substitutes: Synthesis, Characterization and Properties W.Q. Huang, P.P. Liu, B.B. Wang, X.Y. Liu and W.G. Wang	147
Thermal and Optical Properties of Main Chain Polymer Compose of Oligo-L-LA Segments and Biphenol Group J. Peng, Q.B. Xue, H.R. Chen, L.M. Sun and R.T. Dong	151
Synthesis and Mesophases Study on 2-(8-bromooctanoic acid ester)-3,6,7,10,11-pentapentyloxytriphenylene M.X. Zhang, C.X. Zhang, J.L. Pu, H. Wu and G.S. Fang	156
Phase Morphology and Mechanical Properties of PTT/POE-g-MAH Blends M.T. Run, Y. Zhong, B.T. Xing, Q. Han and Q.C. Zhang	160
Synthesis and Mesophases of Azobenzene Compounds with Terminal Vinyl Group S. Sun, W.C. Xu, C.X. Zhang and H. Wu	164
One-Step Synthesis of a Liquid Crystal TB4A at Room Temperature Q.L. Ma, B.G. Zhai and Y.M. Huang	168
CuI/HMPA-Catalyzed Alkylation to Tolan: A Valuable Method for Discotic Liquid Crystal Hexabenzocoronene Y. Jiang, X.Y. Liu, R. Cheng, W.G. Wang and J.L. Pu	173
Synthesis of Polyfluorene with Azobenzene-Substituted Side Chains X.D. Tang, F.Q. Yu, Y. Chen, X. Wang and M.S. Pei	177
Microwave-Assisted Synthesis and Mesomorphic Properties of Novel Unsymmetric Imidazolium as Ionic Liquid Crystals T.Z. Yang, R. Cheng, X.Y. Liu, W.G. Wang and J.L. Pu	181
Synthesis and Characterization of Poly (L-Lactic acid) Containing the Azobenzene Mesogens R.T. Dong, Q.B. Xue, L.M. Sun and Q.X. Zhang	185
Hexabenzocoronenes Bearing Odd Carbon Alkyl Chains as Columnar Discotic Liquid Crystal X.Y. Liu, Y. Jiang, R. Cheng, W.G. Wang and J.L. Pu	189

Mesophase Studies and Charge Transportation Properties of 3,6-dicarbethoxy-2,7,10,11-tetra-pentyloxytriphenylene	
C.X. Zhang, J.L. Pu, H. Wu, A. Zhang, M.X. Zhang and G.S. Fang	193
Synthesis and Performance of a Novel Coumarin-Containing Side-Chain Liquid Crystalline Polymer	
Y.L. Zhao, W.M. Zhang, J.L. Li, F.F. Yu and J.L. Pu	197

III. Display Technologies

A Single-Cell-Gap Transflective Dual-Mode Liquid Crystal Display	
C.P. Chen, T.C. Chung, T.S. Jen, X.J. Guo and Y.K. Su	203
Thermal Design of LED Backlight in High Ambient Temperature	
T. Liu, G.Q. Lv, Q.B. Feng and Y.F. Chang	208
Defect Inspection of LED Chips Using Generalized Regression Neural Network	
Z.L. Pan and L. Chen	212
Using a TN-LC Cell as the Mask to Create Individual Bidirectional Alignment Layer in a Single Photoalignment Exposure	
J.W. Zhou, B. Wang, G.M. Ke, G. Chen and R.X. Li	216
Design of Backward-Detection Optical System in Biological Cell Subclass Identification	
Y.W. Wang, S.W. Jiang, X.K. Wang, X.L. Tian, Q.W. Yue, Y.Y. Xu and X.F. Shang	220
A Nigh-Vision-Compatible LED Backlight for Military Applications	
Y.F. Chang, G.Q. Lv and Q.B. Feng	225
Low Power Test Pattern Design for VLSI Circuits Using Incorporate Pseudorandom and Deterministic Approach	
Z.L. Pan and L. Chen	229
Digital High Resolution Small Pixel LCOS Technology	
D. Cheng, D. Fung and K. Gutttag	233
Synthesis and Electrochromic Properties Based on Star-Shaped Oligothiophene Derivatives with Phenyl Core	
L. Guan, X.Q. Zhao, Y.P. Zhong, P. Liu and W.J. Deng	237
An Adaptive Global LED Backlight Dimming for Contrast Enhancement and Power Reduction	
Q.B. Feng, H. Tong and G.Q. Lv	241
Electroluminescence of Naturally Oxidized Polypyrrole	
Y.M. Huang	245
Defect Feature Acquisition of LED Wafer Using Region Growing Segmentation with Clustering Strategy	
Z.L. Pan, L. Chen and G.Z. Zhang	251

IV. Applications of Liquid Crystals

Effect of Photo-Isomerization of Azo Dyes on the Photonic Bandgap in Chiral Nematics	
D. Statman, A. Jockers and D. Brennan	257
The Fitting Measuring Method Based on Liquid Crystal Electrically Controlled Birefringence	
D. Li, L.L. Bai and Z.Q. Huang	261
Determination of Director Profile in the Vertical Alignment Nematic Liquid Crystal Cell by the Full Leaky Guided Mode Technique	
H.Y. Xing, W.J. Ye, N.F. Wu, L.B. Si and Z.D. Zhang	265
H-PDLC Based Electrically Controlled Optical Chopper Applied within the Fluorescence Microscopy System	
J.H. Zheng, Z.J. Zhou, P.Y. Tang and Y.M. Jiang	269
Tunable Optical Filter with Variable Bandwidth Based on Cholesteric Liquid Crystal	
S.C. Zhang and Y.H. Huang	273
Tunable Liquid Crystal Grating-Based 3D Display	
Z. Zhou and Z.Q. Huang	277

Reflective Chiral-Homeotropic Liquid Crystal Displays Z. Ren, S.T. Li and X.P. Liu	281
Quantitative Determination of Color Coordinates for Luminescent Materials B.G. Zhai and Y.M. Huang	285
Planar Dipole Antenna on Liquid Crystal Polymer Substrate at 2.4 GHz B.T.P. Madhav, V.G.K.M. Pisipati, D.M. Latha and P.V.D. Prasad	289
Research on Non-Electric Readout Infrared Thermal Imaging Detection Technology Based on the Liquid Crystal C.L. Cai, Y. Zhang, X.L. Niu and W.G. Liu	293
Liquid Crystal Variable Retarders' Phase Retardation Measurement with Quarter-Wave Plate and the Validation L.L. Bai, D. Li and Z.Q. Huang	297
Design of GRIN Liquid Crystal Lens for Autostereoscopic 2-D/3-D Switchable Display C.J. Zhang, X.Z. Tang, C.P. Chen, G.F. Huang, H.Q. Cui, B.Y. Si, T.C. Chung and T.S. Jen	301

V. Related Materials

Charge Storage Characteristics of Si-Rich Silicon Nitride and the Effect of Tunneling Thickness on Nonvolatile Memory Performance H.H. Nguyen, N.S. Dang, V.D. Nguyen, K. Jang, K. Baek, W. Choi, J. Raja and J. Yi	307
Negative Differential Resistance Induced by Intermolecular Interaction in Molecular Device C.J. Xia, Y.T. Zhang and X.J. Zai	312
Degradation of Polyimide Film by Corona Aging under Bipolar Pulse Voltage Y. Yang, D. Yin, X. Wang, F.Q. Tian, Q.Q. Lei, J. Shi and R. Xiong	316
Influence of Morphology of Vacuum-Evaporated Oligothiophene Derivative Films on Organic Photovoltaic Performance X.Q. Zhao, L. Guan, Y.P. Zhong, P. Liu and W.J. Deng	320
Effect of B₂O₃ on Microwave Dielectric Properties of Ca[(Li_{1/3}Nb_{2/3})_{0.92}Zr_{0.08}]O_{3-δ}-0.05TiO₂ Ceramics G. Xiong	324
Improvement the Open Circuit Voltage of Amorphous Silicon Solar Cells by Treating the P Layer with Hydrogen Plasma M.J. Shi, L. Xiong and L.L. Chen	328
Photocatalytic Properties of α-Bi₂O₃ Nanoneedle Array Synthesized by Hydrothermal Method H.Y. Wang, Y.C. Yang, L. Le, Y. Liu, J.H. Wei, R. Xiong and J. Shi	332
Good Quality N (a-Si)-P+(Na-Si)-P (μC-Si) Tunnel Junction for Tandem Solar Cells L.L. Chen, M.J. Shi and J.H. Yu	336
Investigation on High Laser-Induced Damage Threshold of ZrO₂-PVP Thin Films by Hydrothermal Synthesis S.Z. Wang, X.Y. Tang, Y.P. Yin, L.L. Chen, L.N. Zhang, D.Z. Li and D.Y. Huang	340
Theory of the Rectifying Performance in Molecular Device: The Role of Anchoring Groups C.J. Xia, H.C. Liu and Y.T. Zhang	344
Extension of the Optical Absorption of TiO₂ Nanoparticles to Visible Light Region by Doping with Cobalt Y. Ding, X.J. Xu, Z.H. Gan, R. Xiong and H.L. Liu	348
Structure and Magnetic Properties of Co_{2.73}Fe_{0.27}O₄ Synthesized by the Heat-Decomposition Method Z.H. Gan, J.B. Guo, J. Liu and Z.H. Lu	352
Biocompatible and Biodegradable Triblock Copolymers via ATRP X.D. Tang, X. Wang, Y.Y. Dou and M.S. Pei	356
Nonlinear Infrared Transmission through and Reflection Off Antiferromagnetic Sandwich NM/AFF/NM D.M. Sun, S.F. Fu, S. Zhou and Q.H. Li	360
Effect of Alloy Disorder Scattering on Electron Mobility Model for Strained-Si_{1-x}Ge_x/Si (101) C. Wang, H.M. Zhang, R.X. Xuan and H.Y. Hu	364

Sol-Gel Derived ZrO₂-PVP Coatings with High Laser-Induced Damage Threshold S.Z. Wang, D. Zhang, M.J. Shi, Y.P. Yin, L.L. Chen, P.H. Luo, Y. Xu and X.F. Guo	370
Origin of Blue Photoluminescence from Naturally Oxidized Porous Silicon Y.M. Huang, Q.L. Ma and B.G. Zhai	374
Electron Mobility Model of Strained Si_{1-x}Ge_x(001) H.Y. Hu, S. Lei, H.M. Zhang, R.X. Xuan and B. Shu	378
Effects of Chloride Ion in TeO₂-ZnO-ZnCl₂-Li₂O-Eu₂O₃ Glass System M.R. Sahar, R. Arifin and S.K. Ghoshal	383
Anisotropic Hole Mobility in Strained Si_{1-x}Ge_x/(001)Si J.J. Song, S. Lei, H.M. Zhang and H.Y. Hu	388
Synthesis of Monodisperse Fe₃O₄ and MnFe₂O₄ Nanospheres by Using a Solvothermal Reduction Method G.H. Ren and Z.S. Yu	393
Mesophase and Optical Properties of Side Chain Copolyacrylate with Mesogens and OLLA Segments Side Chains Y.P. Liu, Z.H. Li, L.M. Sun, R.T. Dong, H.R. Chen and Q.B. Xue	397
Influence of Deposition Temperature on Microcrystalline Silicon Thin Film Prepared by Plasma Enhanced Chemical Vapor Deposition L.L. Chen, S.Z. Wang, Y.P. Yin and M.J. Shi	401
Microwave Dielectric Properties of Ca[(Li_{1/3}Nb_{2/3})_{0.95}Zr_{0.05}]O_{3-δ-x}TiO₂ Ceramics G. Xiong	405
Annealing of a-Si:H Thin Film by Rapid Thermal Process Y.C. Wang and R.M. Jin	409
Investigation of Quantum Beatings at 608 cm⁻¹ and 70 cm⁻¹ in Rb Vapor C.J. Zhu, J.F. He, X.J. Zhai, B. Xue and C.H. Zhang	413
Effect of Sodium Chloride on the Sol-Gel Synthesized Silica Colloidal Particles Y.G. Cai, Q.L. Ma and Y.M. Huang	417
Structure and Raman Investigations of Nitrogen-Doped TiO₂ Nanotube Arrays H.Y. Wang, X.J. Xu, J.H. Wei, R. Xiong and J. Shi	422
Influence of Radio Frequency Power on Microstructure of Microcrystalline Silicon Films S.Z. Wang, D. Zhang, Y.P. Yin, M.J. Shi, D.Y. Huang and J.H. Yu	426
Light Scattering Images of Amplitude, Phase and Polarization from Typical Blood Cells Y.W. Wang, Y.Y. Xu, Q.W. Yue, Y.J. Chen, M. Bu, X.F. Shang and X.L. Zhu	430
Electrodeposition of Polyhedral Copper Crystals on Porous Silicon M. Meng and Y.M. Huang	434
Crystal Structure and Microwave Dielectric Properties of Ca[(Li_{1/3}Nb_{2/3})_{0.95}Zr_{0.15}]O_{3+δ} Ceramics with Pr³⁺ Substitution at A-Site G. Xiong	439
Effect of Rotating Speed on Properties of Antireflective Coatings R.M. Jin, X.F. Guo, Z.D. Cai, L.M. Cang, Y. Tao and X.J. Han	443
Fabrication of High Quality Textured ZnO:Al Thin Films M.J. Shi and L.L. Chen	447
Emission Spectra of Zinc Oxychloride Tellurite Glass: Effects of Eu³⁺/Sm³⁺ Co-Doping M.R. Sahar, R. Arifin and S.K. Ghoshal	451