

Conference on Liquid Crystals - Chemistry, Physics and Applications

XXII CLC'2018

CONFERENCE PROGRAM

MON 17.09.2018

TUE 18.09.2018

WED 19.09.2018

THU 20.09.2018

FRI 21.09.2018

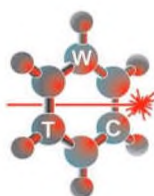


Presentation type / time

Plenary (4)	60 min
Tutorial (4)	60 min
Invited (19)	40 min
Oral (26)	20 min
Poster sessions (A/B/C)	60 min



Military University of Technology



15:00-17:30 Conference desk opening / welcome reception	Invited I-1 (11:30-12:10) C.T. Imrie T3	Invited I-6 (11:30-12:10) F. Araoka T7	Invited I-12 (11:30-12:10) D. Pociecha T3	Invited I-18 (11:30-12:10) W. Zając T3
	Oral O-1 (12:10-12:30) P. Pierański T3	Invited I-7 (12:10-12:50) A.M. Figueiredo Neto T9	Invited I-13 (12:10-12:50) J. Szczytko T4	Invited I-19 (12:10-12:50) Y. Arakawa T1
	Plenary P-3 (12:30-13:30) O. Lavrentovich	Oral O-7 (12:50-13:10) P. Kopčanský T8	Oral O-17 (12:50-13:10) N. Bennis T4	Oral O-26 (12:50-13:10) M. Buczkowska T3
	Lunch (13:30-15:00)	Oral O-8 (13:10-13:30) E. Chrzumnicka T3	Oral O-18 (13:10-13:30) K. Gaładyk T2	
	Invited I-2 (15:00-15:40) M.A. Geday T4	Invited I-8 (15:00-15:40) M. Ozaki T4	Invited I-14 (15:00-15:40) M. Marzec T4	
	Invited I-3 (15:40-16:20) J. Beeckman T7	Invited I-9 (15:40-16:20) E. Miszczyk T4	Invited I-15 (15:40-16:20) I. Dierking T8	
	Invited I-4 (16:20-17:00) M. Godinho T8	Oral O-9 (16:20-16:40) K. Lekenta T4	Oral O-19 (16:20-16:40) E. Wolarz T5	
	Oral O-2 (17:00-17:20) J. Kołacz T4	Oral O-10 (16:40-17:00) A.V. Zakharov T7	Oral O-20 (16:40-17:00) I. Pinkevich T7	
	Oral O-3 (17:20-17:40) P. Malik T6	Oral O-11 (17:00-17:20) K. Kondratenko T5	Oral O-21 (17:00-17:20) W. Tomczyk T7	
	Poster session A (17:50-18:50)	Oral O-12 (17:20-17:40) S. Nath T1	Poster session C (17:30-18:30)	
Supper (17:30-19:30)		Poster session B (17:50-18:50)		
Tutorial T-1 (20:00-21:00) G. Assanto	Bonfire (19:00-22:00)	Supper (19:00-20:00)		
Tutorial T-2 (21:00-22:00) V. Reshetnyak		Tutorial T-3 (20:00-21:00) A. Miniewicz	Banquett (19:00-23:00)	
		Tutorial T-4 (21:00-22:00) X. Quintana		

TOPICS:

- T1. Synthesis and new materials. Phase structure and phase transitions.
- T2. Chiral phases, ferroelectric and antiferroelectric liquid crystals.
- T3. Macroscopic and microscopic properties, the molecular dynamic, confined systems.
- T4. Electro- and thermo-optical effects, display and photonic applications.
- T5. Active, Photosensitive and Conductive Liquid Crystals.
- T6. Polymer liquid crystals and composite structures.
- T7. Theory and molecular modeling.
- T8. Nanomaterials and Nano-composites.
- T9. Lyotropic and phototropic liquid crystals.

Plenary lectures (60 min)		
P-1	J. Lagerwall	Phase separation in liquid crystals: from surprising physics to functional materials
P-2	N. Fruehauf	Liquid crystal light modulators for non-display applications
P-3	O. Lavrentovich	Electro-optics of oblique helicoidal cholesterics
P-4	K. Neyts	Complex liquid crystal geometries created by periodic photo-alignment

Tutorials (60 min)		
T-1	G. Assanto	Nematicons: self-confined light beams in nematic liquid crystals, from nonlinear optics to photonics
T-2	V. Reshetnyak	Tuning surface plasmons with liquid crystal layer
T-3	A. Miniewicz	Nonlinear optical phenomena in photochromic and photorefractive liquid crystals
T-4	X. Quintana	Liquid crystal alignment. A practical guide

Invited speakings (40 min)			
I-1	C.T. Imrie	The Twist-Bend Nematic Phase	T3
I-2	M.A. Geday	Externally addressed spiral phase plates for tunable lenses	T4
I-3	J. Beeckman	Director fluctuations in nematic LCs: simulations, issues and opportunities	T7
I-4	M. Godinho	Liquid crystalline cellulose-based responsive materials	T8
I-5	J. Yoshida	The effect of core chirality in the octahedral metallomesogens on the columnar liquid crystal phases	T1
I-6	F. Araoka	Highly-efficient Lehmann rotation in topological droplets in cholesteric dispersion	T7
I-7	A.M. Figueiredo Neto	Nonlinear optical study of lyotropic-like human Low-Density Lipoproteins in the thermal time-scale regime	T9
I-8	M. Ozaki	Transparent holographic optical elements using cholesteric liquid crystals	T4
I-9	E. Miszczyk	Study of the dispersion of refractive indexes in the visible, near, short and medium infrared regions of nematic liquid crystal mixtures for high-transmission light modulators with very low reflectivity	T4
I-10	C.F. Dietrich	Chiral structures from achiral lyotropic liquid crystals under capillary confinement	T9
I-11	Zhongwei An	High birefringence liquid crystals with wide temperature range and low viscosity	T1
I-12	D. Pociecha	Helicoidal nematic and smectic phases formed by achiral molecules	T3
I-13	J. Szczytko	Towards Bose-Einstein condensation of exciton polaritons at room temperature: tunable liquid crystal microcavities	T4
I-14	M. Marzec	Titanium dioxide-imine compositions: synthesis, self-assembly, thermal and electrical properties	T4
I-15	I. Dierking	From colloids to liquid crystals and back again	T8
I-16	W. Lewandowski	Dynamic self-assembly of nanoparticles using thermotropic liquid crystals	T8
I-17	M. Kohout	Design and Synthesis of Photosensitive Liquid Crystals and their Application in Nanocomposites	T1
I-18	W. Zając	Probing local structure of rod-like liquid crystals in nanosized confinement with small angle neutron scattering	T3
I-19	Y. Arakawa	Synthesis, phase transitions and birefringence for alkythio-containing rod-like mesogens	T1

Oral presentations (20 min)			
O-1	P. Pierański	Generation and handling of nematic monopoles in the dowser texture by flows and fields	T3
O-2	J. Kołacz	Steering beams and probing boundary layers using evanescent waves in liquid crystal-clad waveguides	T4
O-3	P. Malik	Phase transition and optical properties of polymer stabilized blue phase liquid crystals	T6
O-4	R. Caputo	Plasmonic Photo-Thermal Effects in presence of a Liquid Crystal Command Layer	T4
O-5	A.G. Gilani	Azo - hydrazone tautomerism in liquid crystalline hosts	T4
O-6	M. Żurowska	Synthesis and properties of ferro- and antiferroelectric esters with a chiral center based on (S)-(+)-3-octanol	T1
O-7	P. Kopčanský	Nematic- isotropic phase transition in ferronematics	T8
O-8	E. Chrzumnicka	Orientational properties of some fluoro-substituted mesogens with negative dielectric anisotropy	T3
O-9	K. Lekenta	Optical spin Hall effect in a liquid crystal microcavity with tunable TE-TM splitting	T4
O-10	A.V. Zakharov	Diffusion processes in free-standing smectic films	T7
O-11	K. Kondratenko	Molecular p-doping of organic liquid crystalline semiconducting gel	T5
O-12	S. Nath	Oxadiazole and Thiadiazoles based Star-shaped π -Gelators and their structure-property relationship	T1
O-13	A. Kocot	Electric field distortions in structures of the twist bend nematic (NTB) phase of a bent-core and bimesogenic liquid crystals	T3
O-14	B. Das	Dielectric and Electro-Optic Investigations on the Structure Property Relationships of Ferroelectric Liquid Crystals	T2
O-15	A. Drzewicz	Vibrational spectra of chiral smectic liquid crystals differing in the molecular and helicoidal structure	T2
O-16	P. Vaňkátová	Supercritical fluid chromatography – a new tool for the optical purity control of chiral liquid crystals	T2
O-17	N. Bennis	Optimized liquid crystal mixture for frequency controlled birefringence	T4
O-18	K. Gaładyk	Smectic liquid crystal of near constant tilt angle at broad temperature range	T2
O-19	E. Wolarz	Perylene-3,4,9,10-tetra-(n-alkylesters) deposited on solid substrates – layers morphology, crystalline structure, spectral properties, and electrical conductivity	T5
O-20	I. Pinkevych	Impact of light field-driven boundary conditions and the Mauguin regime on two-beam energy exchange in hybrid photorefractive LC cells	T7
O-21	W. Tomczyk	The role of chirality and flexopolarization in the stability of twist-bend nematic and cholesteric phases	T7
O-22	T. Rozwadowski	Molecular dynamics and crystallization kinetics in 4-(2,3-difluoro)-pentylphenyl-trans-4-(2,3-difluoro)-pentylcyclohexylbenzoate nematic liquid crystal	T3
O-23	V. Lapanik	New generation of LCD's based on smectic liquid crystals showing uniform and stable orientation	T4
O-24	E. Rzeszotarska	Ionic liquid crystals based on the [closo-B10H10] 2- cluster	T1
O-25	V. Bezborodov	Advanced Materials, Anisotropy and Self-organizing Systems	T1
O-26	M. Buczkowska	Periodic patterns in flexoelectric nematic layers with surface pretill	T3

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Poster session A (60 min)			
PA-1	A. Alsunaidi	Isotropic-nematic transition of rod-like particles in external fields	T7
PA-2	N. Bennis	Active metasurface at THz based on liquid crystals	T4
PA-3	V. Bezborodov	Anisotropic-based approach for design of structured surfaces, sensors, photonic devices and displays	T4
PA-4	N. Bielejewska	Formation and characterization of polymer/ liquid crystal systems: the effect of concentration of ingredients on the range, stability and the properties of the mesophase	T8
PA-5	A. Bubnov	Self-assembling behaviour of calamitic reactive mesogens with vinyl terminal group	T1
PA-6	A. Bubnov	Chiral photochromic reactive mesogens for design of self-assembling functional polyacrylates	T5
PA-7	O. Buchnev	Optical Multi-Parameter Analyser for Nematic Liquid Crystal Materials and Composites	T4
PA-8	M. Caño-García	All-organic integrated LC optical cross-connect	T4
PA-9	H. Chamati	Molecular dynamics investigation of phase behavior and structural properties of cholesterol-containing lipid membranes	T7
PA-10	M. Czajkowski	Development of new chiral dopants for liquid crystals - helical twisting power and phase behavior studies	T2
PA-11	M. Czerwiński	The influence of four-ring chiral esters on mesomorphic and physicochemical properties of antiferroelectric liquid crystalline mixture	T2
PA-12	K. Czupryński	Synthesis and mesomorphic properties of chiral 2-methyl-butyl terminated polar phenyltolanes with lateral fluorosubstituents	T1
PA-13	D. Dardas	The viscoelasticity of ferroelectric liquid crystals with helicoidally structure in the small deformation and the laminar flow limit	T3
PA-14	D. Malay	High-Resolution Birefringence study of the Smectic-A-to-Reentrant Nematic Phase Transition	T1
PA-15	D. Sayani	Measurement of Optical Birefringence using a High Resolution Temperature scanning technique	T4
PA-16	A. Deptuch	FDDS study of chiral smectogenic 3FmHPf compounds	T2
PA-17	J. Dziaduszek	Synthesis and properties of new fluorosubstituted alkylcyclohexylbenzene terminated cyanoesters	T1
PA-18	P. Fryń	Influence of 4'-pentyl-4-biphenylcarbonitrile and single walled carbon nanotubes on properties of biodegradable polymers	T4
PA-19	K. Gaładyk	Smectic bookshelf structure as quarter-wave plate applied at the Zeeman laser stabilization unit	T4
PA-20	Z. Galewski	4'-(4-Alkyloxyazobenzene) alkanooates – influence of both alkyl chains length on the mesogenic properties	T3
PA-21	B. Gao	Modeling upscaled voltage-driven liquid crystal smart windows	T4
PA-22	K. Garbat	Relaxation frequencies of three- and four-ring compounds and dual frequency addressing mixtures with high birefringence	T1
PA-23	J. Genova	Physico-chemical characterizations of lipid membranes and in presence of cholesterol	T9
PA-24	J. Genova	Investigation of the phase behaviour and mechanical properties of lipid bilayer membranes containing gold nanoparticles	T9
PA-25	P. Morawiak	Tunable liquid crystal multifocal microlens array	T4
PA-26	A. Ranjesh	Optical anisotropy and its critical behavior in temperature-dependent refractive indices of nematic liquid crystals	T1
PA-27	R. Repnik	Controlled targeting of nanoparticles	T8
PA-28	R. Repnik	Nematic liquid crystalline ordering driven migrations of nanoparticles	T8
PA-29	S. Różański	Effective dielectric permittivity of liquid crystal nanodispersions and composites with different pore structure	T8

Poster session B (60 min)			
PB-1	E. Dmochowska	Synthesis of rodlike fluorene derivatives	T1
PB-2	E. Dmochowska	Synthesis and properties of new chiral reactive mesogens for ferro- and antiferroelectric materials	T1
PB-3	P. Harmata	The synthesis and mesomorphic properties of materials with lowered absorption at MWIR	T1
PB-4	J. Herman	New synthetic methodology for high π -electron conjugated unsymmetrical diyne systems	T1
PB-5	J. Herman	Synthesis and properties of oligophenyls and tolans laterally substituted with cyano group	T1
PB-6	M. Jasiurkowska-Delaporte	Hard and soft confinement effects on molecular dynamics of 4-hexyl-4'-isothiocyanatobiphenyl liquid crystal	T3
PB-7	K. Jun Cho	Study on thermal conductivity of aligned liquid crystal polymer using reactive mesogen molecules	T6
PB-8	A. Kalbarczyk	Dynamic phase shift measurements in Liquid Crystals	T4
PB-9	H. Kanto	Stability of cubic phase: molecular simulation study	T3
PB-10	J. Kołacz	Understand and controlling the interaction between graphene and liquid crystal	T3
PB-11	P. Kula	Synthesis and properties of new three and four ring laterally fluorosubstituted cyanodiesteres	T1
PB-12	P. Kumar	Studies on Electro Optic and Anchoring Energy Characteristics of Polymer Dispersed Liquid Crystals	T4
PB-13	B. Kurowski	Impact of nanoparticles on pressure-induced phase transitions in 4-pentyl-4'-cyanobiphenyl (5CB) liquid crystal	T8
PB-14	S. Lalik	Physical properties of binary electro-ferroelectric mixture	T2
PB-15	V.A. Loiko	Scattering by polymer-dispersed liquid crystal films	T6
PB-16	V.A. Loiko	Spectral polarization and transmission of light by stretched polymer-dispersed liquid crystal films	T6
PB-17	A. Lugovsky	Synthesis of alkylstyrenes by Wittig interfacial reaction	T1
PB-18	J. Łoś	Impact of paraelectric nanoparticles on phase transitions and dynamics in 4-n-octyloxy-4'-cyanobiphenyl (8OCB)	T8
PB-19	T. Martyniński	Molecular switches based on liquidcrystalline azobenzene derivatives	T4
PB-20	K. Merkel	Comparison of the various layer contraction at the SmA-SmC transition for de Vries and no de Vries Liquid Crystals	T2
PB-21	K. Nowicka	Angular dependence of the linear and nonlinear electro-optic responses in a polar smectic liquid crystal	T2
PB-22	Z. Parsouzi	Comparison of material parameters among dimer, trimer, and tetramer homologues in the nematic phase	T3
PB-23	P. Perkowski	The evolution of the Cole-Cole model parameters of the molecular relaxation observed at the isotropic-nematic phase transition	T3
PB-24	A. Pianelli	Investigations of Dual Frequency Nematic Liquid Crystals	T4
PB-25	M. Piowowarczyk	Esters of 4-nitrocinnamic acids and 4-halogeno-4'-hydroxyazobenzene – synthesis, mesogenic and optical studies	T1
PB-26	M. Pytlarczyk	4,4''-Dialkynyl-2',3'-difluoroterphenyls - new nematic LC with long conjugated π electronic system	T1
PB-27	X. Quintana	Liquid crystal tuneable millimetre wave reflectarray	T4
PB-28	A. Wąchała	Studies of Twist-Bend nematicogenic bimesogens binary mixtures	T1
PB-29	A. Wąchała	On the balance between nematic and smectic phases in 2',3'-difluoro-4,4''-dialkyl-p-terphenyls	T1

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Poster session C (60 min)			
PC-1	S. Ciastek-Iskrzycka	<i>Molecular design of liquid crystalline bent-core 6-oxoverdazyl derivatives</i>	T1
PC-2	S. Jae Lee	<i>Fringe-Field Switching (FFS) Liquid Crystal Display with High Performance and Power-Saving Mode</i>	T4
PC-3	R. Kowardziej	<i>Terahertz properties of nematic liquid crystal mixtures for applications in thermally switchable devices</i>	T1
PC-4	M. Kurochkina	<i>Structural and electro-optic properties of bent-core mesogens with azobenzene wings</i>	T3
PC-5	R. Mazur	<i>High transparency, low reflection, TN transducers for 633 nm laser radiation</i>	T4
PC-6	A.R. Sampaio	<i>Viscosity peaks at the reentrant isotropic phase transitions: a rheological study</i>	T9
PC-7	O.R. dos Santos	<i>Refractive index measurements in a reentrant discotic nematic –biaxial nematic phase transition</i>	T9
PC-8	V. Sharma	<i>Studies on electro optic and anchoring energy characteristics of polymer dispersed liquid crystals</i>	T4
PC-9	K. Sielezin	<i>Physical Parameters Simulations of Chosen Homologous Series of NLC in THz Range</i>	T3
PC-10	A. Spadlo	<i>Depolarization of light control by vertically aligned nematic liquid crystals cells</i>	T4
PC-11	I. Śliwa	<i>The new type of scaling in thin liquid crystal systems</i>	T7
PC-12	T. Troha	<i>Lactic acid derivatives as ligands attached to silver nanoparticles</i>	T8
PC-13	M. Tykarska	<i>NMR analysis of chiral anticlinic liquid crystalline esters differing in the helicoidal structure</i>	T3
PC-14	B.A. Umanskii	<i>VA-IPS Mode in Nematic Liquid Crystals with Negative Dielectric Anisotropy</i>	T4
PC-15	P. Vaňkátová	<i>Photosensitive reactive mesogens with lateral substitution in vicinity of azo group</i>	T1
PC-16	A. Vassilieva	<i>New highly anisotropic liquid crystal materials for high-frequency applications</i>	T1
PC-17	I. Verma	<i>Poly (L-lysine)-Coated Liquid Crystal Droplets for Sensitive Detection of DNA and its Applications in Controlled Release of Drug Molecules</i>	T3
PC-18	M. Veveričik	<i>Investigation of electro-optical properties and structural changes in nematic liquid crystal doped with superionic nano-compounds</i>	T4
PC-19	R. Walker	<i>Chirality and the twist-bend nematic phase</i>	T3
PC-20	G. Watanabe	<i>Estimating the number of molecules needed to realize nematic isotropic phase transition by molecular dynamics simulation</i>	T7
PC-21	R. Węglowski	<i>Electro-optically tunable q-plates with photoaligned liquid crystal</i>	T4
PC-22		<i>New ferroelectric liquid crystals with short helical pitch</i>	T1
PC-23	D. Węglowska	<i>Observation of blue phases in chiral systems simultaneously containing compounds with positive and negative dielectric anisotropy</i>	T2
PC-24	T. Yevchenko	<i>Electrically-tunable colors of cholesteric liquid crystal</i>	T4
PC-25	H. Yoo	<i>High transmittance with chiral doped optically isotropic liquid crystals</i>	T2
PC-26	J. Yoshida	<i>Octahedral metal complex dopants for chiral nematic phases</i>	T2
PC-27	K-Q. Zhao	<i>Janus-Type Discotic Liquid Crystals: Synthesis, Mesomorphism, and the Capability to Induce Columnar Mesophase Assembly</i>	T1
PC-28		<i>Ionic Discotic Liquid Crystals: Facile Synthesis and Impact of Anion and Deuteration on Mesomorphism</i>	T1
PC-29	P. Zieja	<i>The dependence of the structure of four-ring nematic compounds on the induction of smectic A phase</i>	T1

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Investigation of electro-optical properties and structural changes in nematic liquid crystal doped with superionic nano-compounds

Authors: Marek Veveričík¹, Peter Bury¹, Peter Kopčanský², Milan Timko², Igor Petrovich Studenyak³

Affiliation: ¹Department of Physics, University of Žilina, Univerzitná 1, 010 26 Žilina, Slovak Republic

²Institute of Experimental Physics, Slovak Academy of Sciences, Watsonova 47, 040 01, Košice, Slovakia

³Uzhhorod National University 46 Pidhirna Str., 88000, Uzhhorod, Ukraine

Electro-optic effect and structural changes are studied using two techniques, electro-optical response measurements using linearly polarized laser beam (532 nm) propagating through the liquid crystal (LC) and attenuation measurement of surface acoustic wave (SAW) propagating along sample surface [1]. Three different concentrations (0.1, 0.5 and 0.01 wt%) of superionic nanoparticles $\text{Cu}_6\text{PSI}_5/\text{Cu}_7\text{PS}_6$ in 50:50 ratio dispersed in LC host including pure LC (6CB) were prepared. The role of dopant concentration on structural changes under electric field applied continuously or jump changed was investigated using measurements of the responses of both SAW attenuation and light transmission. Obtained results confirmed the significant role of superionic nanoparticles in LCs on structural changes, electro-optical effect, suspension stability and switching time.

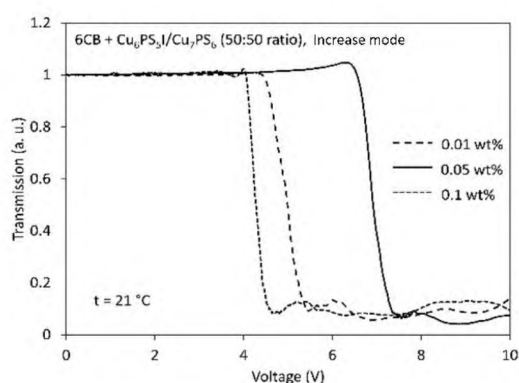


Fig.1. Dependence of optical transmission on external voltage for liquid crystal 6CB doped with three different concentrations of superionic nanoparticles $\text{Cu}_6\text{PSI}_5/\text{Cu}_7\text{PS}_6$ in increasing mode.

[1] P. Bury, M. Veveričík, J. Kúdelčík, P. Kopčanský, M. Timko, V. Závishová, “SAW investigation of structural changes in liquid crystals doped with magnetic particles”, *Acta Acustica united with Acustica* 104 (2018) pp. 48-53