



## Pradip Kumar Mandal

M.Sc., Ph.D.

Professor

Fellow: WB Academy of Science & Technology

Members of Learned Societies: Life Member: Indian Association for the Cultivation of Science, Indian Liquid Crystal Society and International Liquid Crystal Society

### Contact Addresses:

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**Subject specialization:** Condensed Matter Physics

**Professional experience:** Teaching (Since 1986) Research (Since 1981)

**Areas of Research Interest:** Liquid Crystals and nano-composites, Crystallography, Polymers, Sensors, Dye-Sensitive Solar Cells, Organic Field Effect Transistors, Molecular Modeling and Simulation, Electronic Band Structure using DFT.

**No. of PDF students:** 01

**No. of Ph.D. students:** (a) Supervised: 10 (b) Ongoing: 01

**No. of M.Phil. students:** (a) Supervised: Nil (b) Ongoing: Nil

**No. of Patents: Indian:** 01

**No. of Publications:** (a) Book: 01 (b) Book Chapter: 02  
(c) Research/Technical Papers: 103  
(d) Conference papers: 50

### Achievement & Awards:

- Elected as the Fellow of the WB Academy of Science & Technology in 2021.
- Offered Visiting Scientist Position in the Department of Engineering Materials, University of Sheffield, UK, during 1997-1998.
- Offered Short-Term Visiting Scientist Positions in Amsterdam University, The Netherlands, Technical University Darmstadt, Germany and Military University of Technology, Poland and National Institute of Material Science (NIMS), Japan during 1990-2012.
- Awarded Short-Term Visiting Grants (five times) for doing experiments using Synchrotron Radiation Facility of PETRA III at Hamburg, Germany by DST under India@DESY program during 2013-2020.

### Professional expertise:

- Member, PG Board of Studies, Presidency University, Kolkata (2021-25).
- Member, Board of Research Studies, Gour Banga University, Malda (2019-23).
- Editorial Board member, Journal of Crystal Structure Theory and Applications, Scientific Research Publishing Inc., USA (2012-15).
- Member, West Bengal State Council of Science & Technology, Kolkata (2012-15).
- Member, PG Board of Studies, Gour Banga University, Kolkata (2015-19).
- Member, Syllabus Upgradation Committee, State Level Joint Entrance Test for Medical and Engineering (2006).
- Member, District Advisory Committee on Renewable Energy, Jalpaiguri (2005).

### Administrative Experiences:

- Member (elected), The Court, University of North Bengal (1994-1998).
- Head, Department of Physics, NBU for three terms (2001-03, 2005-07 and 2008-10).
- Chairman, UG Board of Studies in Physics, NBU for two terms (2018-21, 2021-25)
- In-charge of Condensed Matter Physics Special Papers Laboratory, NBU since 2003.
- In-Charge, E-mail Facility of Physics Department, NBU (1993-2002).  
(This was the first E-mail facility in the university established with IUCAA funding. All the technical works of installation and maintenance were done by me till the University LAN system was introduced in 2002).
- In-Charge, DST-FIST Facilities, Physics Department, NBU (2002-03).  
(This scheme got sanctioned at my initiative and was the first DST-FIST scheme in NBU)

### Research attainments:

- A very active collaboration has been established with several foreign groups like Amsterdam University, Netherlands; Military University of Technology, Poland; Darmstadt Institute of Technology, Germany.
- A very active collaboration has been established with several Indian groups like BARC, Mumbai; M.S. University, Baroda; RSIC, IIT, Chennai; SSSC Unit, IIS, Bangalore and Chemistry Department, NBU. Researchers from Jadavpur University, Bose Institute and Saha Institute of Nuclear Physics and Regional Engineering College, Silchar have used the facilities developed in my lab.
- Two International projects were sanctioned by DST - one under Indo-German and the other under Indo-Polish International Collaboration Scheme.
- German Ministry of Science and Technology (BMBF, DLR) sanctioned a project on Ferroelectric Liquid Crystals.
- DST sponsored five projects under India@DESY program for doing experiments at Deutches Elektronen Synchrotron (DESY), Hamburg, Germany in which Ph.D. students also visited.
- Nine Major Research Projects completed/ongoing funded by UGC, DST, DAE and IUC-DAEF.
- DAE selected the Ph.D. thesis as the 12-best-thesis-of-the-year-1986 in Solid State Physics category.
- Ph.D Thesis Adjudicator: IIT Delhi, Central Glass and Ceramic Research Institute Kolkata, Jadavpur University, Mysore University, and Mizoram University.
- Convener & Expert: DAE Advanced Technology Project Approval Meeting, NBU, Dec, 2013.
- Subject Expert: Major Research Proposals of SERC (DST), CSIR and BRNS (DAE).
- Subject Expert: Paper Setter, Evaluator, External Examiner (Lab) of Burdwan University, North Eastern Hill University, Visva-Bharati University, Kalyani University, Sikkim University.

### Social Outreach Activities:

- Popularize science writing popular science articles in Uttarbanga Sambad.
- Act as resource person in Science Popularization Programs of North Bengal Science Centre, Siliguri and other Schools and Colleges of North Bengal.
- Organized 3-day Darjeeling District Residential Science Workshop at Muraliganj High School in September, 2014 funded by WB State Council of Science and Technology.

### Visits to places outside India for academic/research purpose:

	Place of visit	Duration	Date	Purpose
i.	Erice, Italy.	2 weeks	April, 1990	Attended International School on Direct methods in Crystallography as one of the only 2 Indian participants selected and sponsored by the Organizers.
ii.	Amsterdam, The Netherlands	2 months	May-June, 1990	Collaborative Research with Prof. H. Schenk, University of Amsterdam, sponsored by University of Amsterdam.
iii.	Amsterdam, The Netherlands	3 months	Oct-Dec, 1991	Collaborative Research with Prof. H. Schenk, University of Amsterdam, sponsored by University of Amsterdam.
iv.	Sheffield, UK	6 months	Oct-March, 1997-98	Visiting Scientist in the Department of Engineering Materials, Sheffield University.
v.	Strasbourg, France	1 week	July, 1998	For presenting a paper in the XVII International Conference on Liquid Crystals in the Centre National de la Recherche Scientifique, Strasbourg.
vi.	Darmstadt, Germany	3 weeks	June, 2002	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under INDO-GERMAN Collaboration Scheme funded by DST

vii.	Warsaw, Poland	10 days	June, 2002	Visiting Scientist in the Laboratory of Prof. Roman Dabrowski, MUT, Warsaw funded by MUT.
viii.	Darmstadt, Germany	3 weeks	October, 2003	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under INDO-GERMAN Collaboration Scheme funded by DST
ix.	Zakopane, Poland	1 week	October, 2003	To deliver an invited talk in the XV Conference on Liquid Crystals at Zakopane, Poland
x.	Darmstadt, Germany	3 weeks	October, 2004	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under INDO-GERMAN Collaboration Scheme funded by DST
xi.	Darmstadt, Germany	12 weeks	June-August, 2006	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under International Collaboration Scheme funded by BMBF, DLR, Germany.
xii.	Augustow, Poland	2 weeks	September, 2007	To deliver an invited talk in the XVII Conference on Liquid Crystals at Augustow, Poland. Also as Visiting Scientist in the Laboratory of Prof. Roman Dabrowski, MUT, Warsaw under Indo-Polish Collaboration Scheme funded by DST
xiii.	Darmstadt, Germany	5 weeks	Sept-Oct, 2007	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under International Collaboration Scheme funded by BMBF, DLR, Germany.
xiv.	Darmstadt, Germany	3 weeks	June, 2008	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under International Collaboration Scheme funded by BMBF, DLR, Germany.
xv.	Warsaw, Poland	5 weeks	June-July, 2008	Visiting Scientist in the Laboratory of Prof. Roman Dabrowski, MUT, Warsaw under Indo-Polish Collaboration Scheme funded by DST
xvi.	Augustow, Poland	10 days	September, 2009	To deliver an invited talk in the XVIII Conference on Liquid Crystals at Augustow, Poland.
xvii.	Darmstadt, Germany	3 weeks	October, 2009	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under International Collaboration Scheme funded by BMBF, DLR, Germany.
xviii.	Darmstadt, Germany	3 weeks	June-July, 2010	Visiting Scientist in the laboratory of Prof. W. Haase, Darmstadt University of Technology, Germany under International Collaboration Scheme funded by BMBF, DLR, Germany.
xix.	Krakow and Warsaw, Poland	10 days	July, 2010	To deliver invited talk in 23 <sup>rd</sup> International Conference on Liquid Crystals at Krakow, Poland. Also visited the laboratory of Prof. Roman Dabrowski, MUT, Warsaw, Poland under Indo-Polish Collaboration scheme.
xx.	Tsukuba, Japan	12 days	June, 2012	To deliver an invited talk in the International Symposium on Brain-like Information Processing followed by visit in the Advanced Nano Characterization Center, National Institute of Material Science, Tsukuba, Japan. Visit was sponsored by NIMS, Japan.
xxi.	Hamburg, Germany	11 days	May, 2013	Visited DESY, Hamburg for studying structural properties of liquid crystals using PETRA III synchrotron radiation, project was sponsored by DST under India@DESY scheme.
xxii.	Mikolajki, Poland	11 days	September, 2013	To deliver a talk in XX Conference on Liquid Crystals on Formulation and characterization FLC mixtures at ambient temperature. Visit was sponsored by DST under IT Scheme.
xxiii.	Hamburg, Germany	10 days	October-November, 2017	Visited DESY, Hamburg for studying nematic nano composites using PETRA III synchrotron radiation, project was sponsored by DST under India@DESY scheme.
xxiv.	Warsaw, Poland	4 days	November, 2017	Visiting Scientist in the laboratory of Prof. Roman Dabrowski, MUT, Warsaw. Visit was sponsored by MUT, Poland.
xxv.	Hamburg, Germany	10 days	October, 2018	Visited DESY, Hamburg for studying self-assembled chiral smectic phases using PETRA III synchrotron radiation, project was sponsored by DST under India@DESY scheme.

## Visits abroad by Ph.D. students for academic/research purpose:

My Ph.D. students (Dr. S. Haldar, now a member of NBU Physics faculty and Dr. B. Jaishi, now Lecturer, Physics Department, Sikkim Government College, Gangtok) visited Darmstadt University of Technology, Germany for one month in 2007, visit was supported by BMBF, DLR, Germany under our International Collaboration Project. They also presented paper at XVII conference on Liquid Crystals at Augustow, Poland, which was supported under our Indo-Polish Collaboration scheme.

Four other Ph.D. students, Dr. Debashis Sinha (2013 and 2015) and Dr. Asim Debnath (2015, 2018), Dr. Kartick Ch. Dey (now Lecturer, APCR Govt.College, Siliguri) (2017) and Dr. Debarghya Goswami (now Lecturer, St. Joseph's College, Darjeeling) (2018) visited DESY, Hamburg, Germany for conducting experiments using synchrotron radiation facility, these visits were also supported by DST under our India@DESY projects.

## Research publications at a glance:

• Publications in the field of	<b>Achiral Liquid Crystals</b>	<b>36</b>
	<b>Ferroelectric LCs</b>	<b>30</b>
	<b>Crystallography of LCs</b>	<b>19</b>
	<b>LC-nano composites</b>	<b>2</b>
	<b>Polymer</b>	<b>3</b>
	<b>DSSC</b>	<b>3</b>
	<b>Electronic Band Structure</b>	<b>10</b>
	<b>T O T A L</b>	<b>103</b>

## Journal wise publications:

Molecular Crystals & Liquid Crystals (28)	Liquid Crystals (16)
Journal of Molecular Liquids (10)	Phase Transitions (10)
Physical Review Letters (1)	Physical Review Phocus (1)
Scientific American (1)	Acta Crystallographica E (2)
Crystal Research & Technology (1)	Japanese J of Applied Physics (1)
Applied Physics Letters (1)	J of Applied Physics (2)
Physica B (1)	Opto-Electronic Review (1)
RSC Advances (1)	J of Alloys & compounds (1)
Research J. of Chemical Sciences (1)	Applied Solar Energy (1)
J Physics & Chemistry of solids (1)	Computational Condensed Matter (2)
Material Science in Semicon. Processing (1)	SPIE (2)
Material Research Express (2)	Journal of Material Science (1)
Int J Thermophys (1)	AIP Conference proceedings (5)
Materials Today: Proceedings (1)	DAE SSP Symposium Proceedings (2)
Indian J of Physics (1)	Nepal J. Science & Technology (1)
J Phys Conf series (1)	DST Project Report (1)
DESY Photon Science Annual Report (1)	

## Book:

Fortran Self-taught with Applications in Numerical Analysis. Himalayan Pub. House, Mumbai, 2021.

## Book chapters:

Information systems design and Intelligent Applications, Springer 2015.

Recent trends in Material Science and Applications, Springer 2017.

## Patent:

'High temperature liquid crystalline azoxy compounds and method of preparation'; P. Das, A.N. Biswas, **P.K. Mandal** and P. Bandyopadhyay, *Indian Pat. Appl.* (2010), IN 2008KO01957 A 20100514.

## LIST OF PUBLICATIONS (in chronological order)

Sl. No.	Title of the Paper	Authors	Name & Vol. No. of the Journal & year	Page No. from to
1.	X-ray studies on the mesogen 4'-n-Pentyloxy-4-biphenylcarbonitrile (SOCB) in the crystalline state.	<b>P.Mandal</b> and S.Paul	Mol.Cryst.Liq.Cryst. <b>131</b> , 1985	223- 235
2.	Studies on the mesophases of OOBPD by X-ray diffraction method.	<b>P.Mandal</b> R.Paul & S.Paul	Mol.Cryst.Liq.Cryst. <b>131</b> , 1985	299- 314
3.	Crystal and molecular structure of the nematogenic compound 4-Cyanophenyl-4'-n-heptylbenzoate(CPHB).	<b>P.Mandal</b> ,S.Paul, H.Schenk & K.Goubitz.	Mol.Cryst.Liq.Cryst. <b>135</b> , 1986	35 48
4.	X-ray diffraction studies on liquid crystals in solid and mesomorphic phases.	<b>P. Mandal</b>	Proc. DAE SSP Symp. <b>29A</b> , 1986	254 263
5.	X-ray diffraction and optical studies of oriented Schiff's base compound BBBA in liquid crystalline phase.	<b>P.Mandal</b> ,M.Mitra, S.Paul & R.Paul	Liquid Crystals <b>2</b> , 1987	183 193

Sl. No.	Title of the Paper	Authors	Name & Vol. No. of the Journal & year	Page No. from to
6.	Nematic order of APAPA from X-ray diffraction and optical studies.	<b>P.Mandal</b> , M.Mitra, K.Bhattacharjee, R.Paul & S.Paul	Mol.Cryst.Liq.Cryst. <b>149</b> , 1987	203 210
7.	X-ray diffraction studies on liquid crystals in solid and mesomorphic phases.	<b>P. Mandal</b>	Phase Transitions <b>9</b> , 1987	81
8.	Order parameters of some homologous cybotactic nematics from X-ray diffraction measurements.	B.Jha S.Paul, R.Paul & <b>P.Mandal</b>	Phase Transitions <b>15</b> , 1989	39 48
9.	An X-ray study on cyanophenyl pyrimidine Part I :Crystal structure of PCCPP.	<b>P.Mandal</b> , B.Majumdar, S.Paul, H.Schenk & K.Goubitz	Mol.Cryst.Liq. Cryst. <b>168</b> , 1989	135 146
10.	X-ray studies of cyanophenyl pyrimidines, part II: Crystal and molecular structure of 5-(4-Ethylcyclohexyl)-2-(4-cyanophenyl) pyrimidine.	<b>P.Mandal</b> , S.Paul, C.Stam and H.Schenk	Mol.Cryst.Liq.Cryst. <b>180B</b> , 1990	369 378
11.	An X-ray study of Cyanophenyl Pyrimidines Part III: Crystal Structure of 5-(trans-Heptylcyclohexyl)-2-(4-cyanophenyl) pyrimidine.	S.Gupta, <b>P.Mandal</b> , S.Paul, M.de Wit, K.Goubitz and H.Schenk	Mol.Cryst.Liq.Cryst. <b>195</b> , 1991	149 159
12.	X-ray diffraction and optical studies of three members of a homologous series of alkyl cyclohexyl cyanophenyl pyrimidine	S.Gupta, <b>P.Mandal</b> , B.Majumder, R.Paul & S.paul	Phase Transitions <b>40</b> , 1992	73 83
13.	Crystal and molecular structure of a cybotactic nematic compound bis-(4'-n-butoxybenzal)-2-chloro-1,4-phenylenediamine.	<b>P.Mandal</b> , S.Paul, H.Schenk and K.Goubitz	Mol.Cryst.Liq.Cryst. <b>210</b> , 1992	21 30
14.	Neutron Scattering from nematic phase of a mesogenic compound	S. Paul, R. Paul, P. Mandal, K Usha Deniz & S. K. Paranjpe	Proc. DAE SSP Symp. <b>36C</b> , 1993	425
15.	X-ray structural analysis of a mesogenic compound Bis-butoxybenzylidene-bi-p-toluidine compounds.	<b>P.Mandal</b> , S.Paul, H.Schenk and K.Goubitz	Mol.Cryst.Liq.Cryst. <b>258</b> , 1995	209 216
16.	Small angle X-ray scattering studies on smectic and nematic phases of a toluidine compound.	P.K.Sarkar, S.Paul & <b>P.Mandal</b>	Mol.Cryst.Liq.Cryst. <b>265</b> , 1995	249 255
17.	Determination of molecular properties of some polar mesogenic compounds.	A,Nath, <b>P.Mandal</b> , S.Paul & B.Chaudhury	Mol.Cryst.Liq.Cryst. <b>281</b> , 1996	57 63
18.	Structural analysis by X-ray diffraction of a non-polar alkenyl liquid crystalline compound.	A.Nath, <b>P.Mandal</b> , S.Paul & H.Schenk	Liquid Crystals <b>20(6)</b> , 1996	765 770
19.	Physical and molecular properties of three mesogenic phenyl cyclohexyl compounds.	A.Nath, <b>P.Mandal</b> & S.Paul	Mol.Cryst.Liq.Cryst. <b>299</b> , 1997	483 489
20.	Small angle X-ray diffraction study of mixtures showing re-entrant nematic phase and induced smectic A <sub>d</sub> phase.	S.K.Giri, N.K.Pradhan R.Paul, S.Paul, <b>P.Mandal</b> , R.Dabrowski, M.Brodzik & K.Czuprinski	SPIE <b>3319</b> , 1998	149 153
21.	Molecular structure and packing in the crystalline state of 4-n-Ethyl-4'-cyanobiphenyl(2CB) by single crystal diffraction.	P.K.Sarkar, P.Sarkar, <b>P.Mandal</b> & T.Manisekaran	Mol.Cryst.Liq.Cryst <b>325</b> , 1998	91 97
22.	Small angle X-ray diffraction studies on the homologous series of mesogenic 4-(trans-4'-n-alkylcyclohexyl) isothio cyanatobenzenes.	P.Sarkar, <b>P.Mandal</b> , S.Paul, R.Paul, R.Dabrowski & K.Czuprinski	Mol.Cryst.Liq.Cryst <b>330</b> , 1999	159 165

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23.	The temperature dependence of static dielectric permittivities and dipole moments of two mesogens and their mixtures.	P.Sarkar, S.Paul & <b>P.Mandal</b>	Mol.Cryst.Liq.Cryst <b>330</b> , 1999	87 94
24.	Study of dielectric anisotropy of an ester/biphenyl mixture exhibiting an injected smectic	S.K.Giri, <b>P.Mandal</b> & S.Paul	Mol.Cryst.Liq.Cryst. <b>330</b> , 1999	343 350
25.	Refractive index, density and order-parameter of two binary mixtures showing reentrant nematic phase.	S.K.Giri, N.K.Pradhan, R.Paul, S.Paul, <b>P.Mandal</b> , R.Dabrowski, M.Brodzik & K.Czuprinski	Mol.Cryst.Liq.Cryst. <b>330</b> , 1999	113 120
26.	X-ray scattering studies on two nematicogenic p-alkylphenyl-2chloro-4-(p-alkylbenzyloxy)-benzoate and their mixtures.	P.Sarkar, P.K.Sarkar, S.Paul & <b>P.K.Mandal</b>	Phase Transition <b>71</b> ,2000	1 12
27.	Dilution wave and negative order crystallization kinetics of chain molecules.	G.Ungar, <b>P.K.Mandal</b> P.G.Higgs, D.S.M. de Silva, E.Boda & C.M.Chen	Phys.Rev.Letts. <b>85</b> , 2000	4397 - 4400
28.	DSC, density and refractive index studies on two nematogenic p-alkylphenyl-2-chloro-4-(p-alkylbenzyloxy)-benzoate and their mixtures.	Parimal Sarkar, Sukla Paul & <b>Pradip Mandal</b>	Phase Transitions <b>72</b> , 2000	25 41
29.	Suicidal crystals	G.Ungar, <b>P.K.Mandal</b> P.G.Higgs, D.S.M. de Silva, E.Boda & C.M.Chen	Phys. Rev. Phocus <b>6</b> , 2000	21 24
30.	Self-Poisoning Polymer Crystal	G.Ungar, <b>P.K.Mandal</b> P.G.Higgs, D.S.M. de Silva, E.Boda & C.M.Chen	Scientific American 14 November, <b>283</b> , 2000	14 16
31.	Small angle X-ray diffraction study for the determination of structural parameters of two mesogenic compounds having smectic C phase.	S.Ghosh, <b>P. Mandal</b> , S.Paul, R.Paul & M.E.Neubert	Mol.Cryst.Liq.Cryst. <b>365</b> , 2001	703 710
32.	Study of physical properties of binary mixtures of two nematogens.	S.Giri, <b>P.Mandal</b> & S.Paul	Mol.Cryst.Liq.Cryst. <b>365</b> , 2001	711 719
33.	Anisotropic atomic displacement parameters and molecular motions in mesogenic crystals.	<b>P.Mandal</b> , S.Paul & R.Paul	Mol.Cryst.Liq.Cryst. <b>365</b> , 2001	721 728
34.	Minimum energy configuration of dimmers of ethyl, pentyl and heptyl members of 5-(trans-4-alkylcyclohexyl)-2-(4-cyanophenyl) pyrimidine.	Pranab Sarkar, Sukla Paul & <b>Pradip Mandal</b> .	Mol.Cryst.Liq.Cryst. <b>365</b> , 2001	535 542
35.	X-ray diffraction, optical birefringence, dielectric and phase transition properties of the long homologous series of nematogens 4-(trans-4'-n-alkylcyclohexyl)isothiocyanatobenzenes.	Parimal Sarkar, <b>Pradip Mandal</b> , Sukla Paul, Ranjit Paul, R. Dabrowski & K. Czuprynski	Liquid Crystals <b>30</b> , 2003.	507 527
36.	The molecular and crystal structure of a polar mesogen 4-cyanobiphenyl-4'-hexylbiphenyl carboxylate.	B. R. Jaishi, <b>P. K. Mandal</b> K. Goubitz, H. Schenk, R. Dabrowski & K. Czuprynski.	Liquid Crystals <b>30</b> , 2003	1327 - 1333
37.	Study of SmecticA to Nematic phase Transition.	<b>P K Mandal</b> , S. Paul & R Paul	<b>Project Comp. Report to DST</b> November, 2003.	
38.	Optical microscopy, DSC and X-ray diffraction studies on octyl and decyl members of the homologous series 4(4'-n-alkoxybenzyloxy)phenyl azo-4''-isoamyloxy benzene.	S Biswas, <b>P K Mandal</b> P R Patel & J S Dave	SPIE <b>5565</b> , 2004	251 256

Sl. No.	Title of the Paper	Authors	Name & Vol. No. of the Journal & year	Page No. from to
39.	Dielectric study in nematic and smectic A phases in binary mixtures of pentyloxy cyanobiphenyl with three p-azoxybenzenes.	B. R. Jaishi & <b>P. K. Mandal</b>	Phase Transitions <b>78</b> , 2005	569-592
40.	Bis[4-(n-octyloxy)phenyl]diazeneoxide	P Das, D N Neogi, S Upreti, <b>P K Mandal</b> & P Bandyopadhyay	Acta Cryst. <b>E61</b> , 2005	3602 3604
41.	Optical microscopy, DSC and Dielectric relaxation spectroscopy study on ferroelectric liquid crystalline compound MHPO(13F)BC.	<b>P K Mandal</b> , B R Jaishi, W Haase, R Dabrowski M Tykarska & P Kula	Phase Transitions <b>79</b> , 2006	223-235
42.	Optical microscopy, DSC and x-ray diffraction studies in the binary mixtures of pentyloxy cyanobiphenyl with three p-azoxybenzenes.	B R Jaishi & <b>P K Mandal</b>	Liquid Crystals <b>33</b> , 2006	753-765
43.	X-ray diffraction and optical birefringence studies on four nematogenic bifluorobenzene derivatives.	S Biswas, S. Haldar, <b>P K Mandal</b> & W Haase	Liquid Crystals <b>34:3</b> , 2007	365-372
44.	Crystal structure of a polar nematogen 4-(trans-4-undecylcyclohexyl) isothiocyanatobenzene	S. Biswas, S. Haldar <b>P K Mandal</b> , K Goubitz, H Schenk & R Dabrowski	Cryst. Res. & Tech. <b>42</b> , 2007	1029-1035
45.	Novel synthetic route to liquid crystalline 4,4'-bis(n-alkoxy)azoxy benzenes: spectral characterization, mesogenic behaviour and crystal structure of two new members	Purak Das, Achintesh N Biswas, Amitava Choudhury, Pinaki Bandyopadhyay, Sripada Haldar, <b>Pradip Kumar Mandal</b> & Shailesh Upreti	Liquid crystals <b>35(5)</b> , 2008	541-548
46.	3-(4'-(4"-Undeyloxybenzoyloxyphenyl) carboxylatophenyl)-1-phenyltriazene-1-oxide	P. Das, A.N. Biswas, S. Upreti, <b>P.K. Mandal</b> & P. Bandyopadhyay	Acta Cryst E <b>E64</b> , 2008	676-690
47.	Synthesis and Liquid Crystalline properties of Novel Triazene-1-oxide derivatives	Purak Das, A N Biswas, P. Bandyopadhyay & <b>P K Mandal</b>	Mol. Cryst. Liq. Cryst. <b>490</b> , 2008	3-15
48.	Liquid crystalline aryltriazene-1-oxides with two ester units: synthesis, characterization, structure and thermal properties	Purak Das, A N Biswas, S Acharya, A. Chaudhury P. Bandyopadhyay & <b>P K Mandal</b>	Liquid Crystals <b>35(7)</b> , 2008	895-903
49.	X-ray structural analysis in the crystalline Phase of a nematogenic fluorophenyl compound	S. Haldar, S Biswas, <b>P. K. Mandal</b> , K. Goubitz, H. Schenk & W. Haase	Mol. Cryst. Liq. Cryst. <b>490</b> , 2008	80-87
50.	X-ray studies in the crystalline and nematic phases of 4'-(3, 4, 5-trifluoro-phenyl)-4-propyl-bicyclohexyl	<b>Mandal Pradip</b> , Haldar Sripada, Prathap S. J., Guru Row T. N., W. Haase	Liquid Crystals <b>35</b> , 2008	1307-1312
51.	Induction and enhancement of ferroelectric SmC* phase in multi-component room temperature mixtures	<b>P K Mandal</b> , S. Haldar A Lapanik, W. Haase	Jpn. J Appl. Phys. <b>48</b> , 2009	011501-6
52.	Structure of liquid crystalline 1-phenyl-3-{4-[4-(4-octyloxybenzoyloxy)phenoxy-carbonyl]phenyl}triazene-1-oxide at low temperature	P. Das, A. N. Biswas S. Acharya, A. Choudhury, P. Bandyopadhyay P. K. Mandal, S. Upreti	Mol. Cryst. Liq. Cryst. <b>501</b> , 2009	53-61
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Sl. No.	Title of the Paper	Authors	Name & Vol. No. of the Journal & year	Page No. from to
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Sl. No.	Title of the Paper	Authors	Name & Vol. No. of the Journal & year	Page No. from to
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Sl. No.	Title of the Paper	Authors	Name & Vol. No. of the Journal & year	Page No. from to
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<b>Sl. No.</b>	<b>Title of the Paper</b>	<b>Authors</b>	<b>Name &amp; Vol. No. of the Journal &amp; year</b>	<b>Page No. from to</b>
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