

DR. INDIRA NIGAM

Professor

B.sc., B. Tech. Chemical Tech. (Plastic Tech.), M. Tech. Chemical Tech. (Plastic Tech.),Ph.D. Chemical Tech. (Plastic Tech.)

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Personal details

Date of birth : 24th January 1964

Husband's name: Dr. Dharendra Nigam

Residential Address : 111/323, ASHOK NAGAR, KANPUR-208012.

Phone No.: 0512-2541889.

Profile, skills and values

A good academician and researcher, Examiner for various colleges and universities

Participated in national and international conferences and seminars for upgradation of knowledge

A good learner and attended workshops and faculty development courses

A good administrator and worked at various administrative positions

Hard worker and believe in development of everyone working with me

Educational Qualifications

Ph.D. (Chem. Tech.) 1994

Title of the thesis: Rheological characterization of blends of polycarbonate with various polymers
H.B.T.I., Kanpur University.

M. Tech. (Chem. Tech.) 1989
Plastic Technology

H.B. Technological Institute, Kanpur,
First Division with Honours (88.8%)
First Position in the Branch.

B. Tech.(Chem. Tech.) 1986
Plastic Technology

H.B. Technological Institute Kanpur,
First Division with Honours (80.8%)
First Position in the Branch.

B.Sc. 1983

Kanpur University, Kanpur,
First Division. (66.7%)

Intermediate 1981

U.P. Board, Allahabad,
First Division (70.8%)

High School 1979

U.P. Board, Allahabad,
First Division with Honours (78%)

Experience Record

Teaching Experience 26 years of teaching experience in Plastic Department H.B.T.I.,

As Lecturer from 9th October 1995 to 1999
As Senior Lecturer from 9th October 1999 to 2004
As Assistant Professor from 9th October 2004 to 2007
As Associate Professor from 9th October 2007 to 2012
As Professor from 5th October 2012 to present date
As HOD from 20th August 2020 to present date

Professional Experience

Worked as Research Engineer in Thapar Corporate R & D Center(TCRDC), Patiala from May1995 to Oct1995
Worked as Technical Manager at Krishna Engineering Pvt. Ltd., KANPUR from July 1993 to May1995
Worked as Senior Research Fellow CSIR,NEW DELHI from July 1990 to June1993
Worked as Senior Research Fellow MHRD, NEW DELHI from Dec. 1989 to June1990
Worked as Research Assistant Dept. of Chemical Engineering, IIT Kanpur from July1986 to April 1987

Research Experience

Research Projects:

- 1.'Synthesis & Characterization of copolymer of Styrene and Maleic Anhydride' sponsored by Dhupar Chemicals Pvt. Ltd. Kanpur
2. 'Corrosion Resistant Coatings based on Polyacrylate /Nano-clay composites (PNC)' The project cost is Rs 5.5 lakhs and sponsored by All India Council of Technical Education (AICTE) New Delhi.
3. 'Studies on miniemulsion polymerization of styrene-acrylic-based copolymer for pressure sensitive adhesives' The project cost is Rs 2.4 lakhs and sponsored by TEQIP II, H.B. technical university Kanpur-208002

Research Guidance/ Supervision of Ph.D. students:

- 1.Ms. Suman Kumari on 'Studies on Synthesis of Modified Copolymer of Styrene and Maleic Anhydride'
- 2.Ms. Sweta Bajpai on 'Effect of Higher Acrylates on the Synthesis and Characterization of Crosslinkable Copolymers of MMA and Diacrylate/ Dimethacrylates'.Anhydride'
- 3.Ms. Rashmi Katiyar on 'Synthesis and Characterization of Copolymers of fullerene with vinyl monomers using Bismuthoniumylide as a novel initiator

Published Papers:

1. Rheological Studies of Blends of Polycarbonate and Poly (acrylonitrile butadiene styrene I. Nigam and G.N. Mathur; Polymer; 35 (12),2631 (1994).
2. Synthesis and Evaluation of an Interpolymer Anionic Reverse Osmosis Membrane Derived from Poly (vinyl alcohol) and poly (styrene sulfonic acid) I. Nigam and G.N. Mathur; CHEMCON-89 Secretariat for Annual Convention of AICHE; 14, 34(19909)
3. Blends Effect of Rubber-Content of ABS on Properties of PC/ABS Blends : I. Rheological, Mechanical and Thermal Properties I. Nigam, D. Nigam and G.N. Mathur, Polymer Plastic Technology and Engineering; 44(5)815-832,(2005)
4. Synthesis and Characterization of Alkali Modified Styrene Maleic Anhydride for Dispersion of TiO₂ Suman Kumari, D. Nigam, D. Agarwal and I.Nigam; J.A. P. Sc. 103(5), 3194-3205 (2006)
5. Copolymers of Styrene and Maleic Anhydride : Reactivity Ratio, Physical Behavior and Spectral Properties; Suman Kumari , D. Nigam , D. Agarwal and Indira Nigam; Paint India; November 2008, 69-85.
6. Swelling Behaviour of Poly(MMA-co-BA-co-PPGDA) polymers; Sweta Bajpai, J. S. P. Rai and Indira Nigam; J. A. P. Sc., 112(4) 2374-2384 (2009).
7. Synthesis and Characterization of Methyl methacrylate-n-Butylacrylate lattices; Sweta Bajpai J. S. P. Rai and Indira Nigam; Int. J. Plastic Technology; 12(2), 1039-1045 (2009).
8. Copolymerization of Fullerene (C₆₀) and Methyl methacrylate (MMA using Triphenyl bis-muthonium ylide as a Novel initiator and characterization of the copolymers (C₆₀-MMA) R. Katiyar, D.S.Bag and I. Nigam; J. Macromol. Sc. A: Pure & Appl. Chem.; 47(5) 468-474 (2010).
9. Synthesis and characterization of Poly(MMA-co-EHA-co-PPGDA) latices Sweta Bajpai, J. S. P. Rai and Indira Nigam; Journal of Applied Polymer Science; 122(1)676-684 (2012)
10. Synthesis And Characterization of Crosslinkable Copolymers Of MMA with Diacrylate /Dimethacrylate; Stuti, J. S. P. Rai and Indira Nigam, Malaysian Polymer Journal; 7(1), 34-41, (2012).
11. Thermal Properties of Fullerene (C₆₀) containing Poly (alkyl methacrylate)s; R. Katiyar, D.S.Bag and I. Nigam; Thermochimica Acta; 557, 55-60,(2013).
12. Radical polymerization of ethyl methacrylate (EMA) in presence of Fullerene (C₆₀) using Triphenyl bis-muthonium ylide as a Novel initiator and characterization of the copolymers (C₆₀-EMA); R. Katiyar, D.S.Bag and I. Nigam; J. Polym. Res.; 20:243 (2013)
13. Radical Copolymerization of Fullerene (C₆₀) and n-butyl methacrylate (BMA) using Triphenyl bis-muthonium ylide as a novel initiator and characterization of (C₆₀-BMA) copolymers;R. Katiyar, D.S.Bag and I. Nigam; International J. of Chemical Kinetics; 43:608-619(2011).
14. Synthesis and Evaluation of swelling characteristics of Fullerene (C₆₀) containing crosslinked Poly (2-hydroxyethyl methacrylate) hydrogels; R. Katiyar, D.S.Bag and I. Nigam; Advanced Matt. Letters; 5(4)214-222 (2014)
15. Fullerene (C₆₀) containing Poly (N-isopropylacrylamide) Thermoresponsive Smart hydrogels and their swelling behaviour R. Katiyar, D.S.Bag and I. Nigam; J. Polymer Materials; 30(1)15-26(2013).
16. Synthesis and Characterization of Alkali Modified Styrene Maleic Anhydride for Dispersion of carbon black; Suman Kumari, D. Nigam, D. Agarwal and I.Nigam; Int. J. Plast. Technol; 15(2)112-132(2011).
17. Fullerene (C₆₀) Containing Cross-linked Polyacrylate nanocomposites: Synthesis and Evaluation of their Properties, Rashmi Katiyar, Indira Nigam, Dibyendu S Bag; Journal of Nanoscience and Nanotechnology 17(3) 1830-37(2017)

Conference/Seminar/Workshop/Symposia:

S. No.	Title of the paper presented	Title of conference /seminar	Organized by	Date	Status of participation
1	Blends of Polycarbonate and Poly (ethylene terephthalate) : Thermal Analysis and Determination of Polymer-Polymer Interaction Parameter	10th National Symposium on Thermal Analysis	DMSRDE, Kanpur	Dec. 1995	Attended & presented a paper
2	Viscoelastic Properties and Morphology of Blends of Polycarbonate and Poly (ethylene terephthalate)'	National Conference on Electron Microscopy	DMSRDE, Kanpur	Dec. 1998	Attended & presented a paper
3	Rheological Properties of Blends of Polycarbonate and Poly (ethylene terephthalate)	MACRO-2000	DMSRDE, Kanpur	9 th - 11 th Dec. 2000	Attended & presented a paper
4	Biodegradable Polymers	New Horizons in Bioscience	DG College Kanpur	29 th -30 th Nov. 2005	Presented a Invited Lecture
5	Synthesis & characterization of crosslinkable copolymer of MMA and diacrylate/ dimethacrylate	Polymer-2006 National Conference of SPS, India	IACS Kolkata	9 th -10 th Feb. 2006	Attended & presented a paper
6	Water resistant films of crosslinked copolymer of MMA & EHA	POLY-2008, APA International Conference on Advances in Polymer Science & Technology	IIT,Delhi & Asian Polymer Assoc.	28 th -31 st Jan. 2008	Attended & presented a paper
7	Effect of polymeric emulsifier on synthesis and properties of cosslinkable Copolymers	13th International Association of Colloid & Interface Scientists Conference on Surface and Colloid Science and 83rd ACS Colloid and Surface Science Symposium	IACIS & ACS Columbia University New York, USA	14 th -19 th June 2009	Attended & presented a paper
8	Effect of PPGDMA on water resistance of MMA/EHA Copolymers	National Seminar on surfactants & chemicals	Oil Tech Assoc of India & AIChE	27 th -28 th Feb. 2010	Attended & presented a paper
9	Emulsion Copolymers Of Acrylate	National Seminar on Introduction to	Dept. of Chemistry VSSD	22 nd - 23 rd Oct.	Attended & presented a

	Copolymers	Green Chemistry : Introduction, Theory & Practice	College Kanpur	2010	paper
10	Nanocomposites Based On Crosslinkable Polyacrylate Copolymers	Polymer Science and Engineering: Emerging Trends, PSE-2010'	University Institute of Chemical Engineering and Technology Punjab University Chandigarh	26-27 th Nov. 2010	Attended & presented a paper
11	Synthesis and characterization of Poly(MMA-co-EHA-co-PPGDA) Latices	Third International Multicomponent Polymer Conference(IMPC-2012)	Centre for Nanoscience and nanotechnology Mahatma Gandhi University Kottayam Kerala	23-25 th March 2012	Attended & presented a paper
12	Synthesis and characterization of Fullerene containing Hydrogels	'International conference on Polymers Frontiers of Sci. and Tech. APA-2013'	UICET, Punjab Uni., Chandigarh	21 st -23 rd Feb. 2013	Attended & presented Paper
13	Hydrophobicity of Fullerene containing Hydrogels	'International conference on Advancements in Polymeric Materials APM-2013	CIPET, Lucknow	1 st -3 rd March 2013	Attended & presented Paper
14	Water resistant polymer coatings	First symposium on Advances in Sustainable Polymers (ASP-14)	IIT, Guwahati	10-11 th Jan. 2014	Attended & presented Paper
15	Thermoresponsive Smart Hydrogels	APA International Conference on Polymers: Visions & Innovations (APA-2014)	IIT, Delhi & Asian Polymer Assoc.	19 th -21 st Feb. 2014	Attended & presented Paper
16	Fullerene containing Polymers: Synthesis & characterization	Conference on MMSBT (Microscopy in Material Science & Biomimetic Technology)	DMSRDE, KANPUR & AMST	26 th -28 th Feb. 2015	Presented an invited talk
17	Amine modified Copolymers of styrene maleic anhydride for absorption of metals from waste water	International conference on Advancements in Polymeric Materials (APM 2016)	CIPET & LARPM Bhubaneswar at CIPET Ahmedabad	12 th -14 th Feb. 2016	Attended & presented Paper

Refresher courses attended:

S. No.	Name of Refresher Course	Name of Organizing Institute	Date	Objective
1.	Applications Of Computers in Textiles	ISTE, N. Delhi and GCTI, Kanpur	5 th -17 th June 2000	Exposure to Computer applications
2.	Textiles in 21 st Century	ISTE, N. Delhi and GCTI, Kanpur	3 rd -15 th July 2000	Exposure to latest polymer Fibers
3.	Optical Fibers and its Applications	TTTI, Chandigarh & ISTE,N. Delhi	17 th -21 st Sept. 2001	Basic Concepts of Optical fibers, their manfg methods, uses & future prospects & uses
4.	Technological Developments in Textiles	ISTE, N. Delhi and GCT I, Kanpur	24 th -29 th Jan.2002	Latest developments in Textiles
5.	Eco-Friendly Chemical Technologies	AICTE,N. Delhi & H.B.T.I. Kanpur	11 th -24 th March 2002	Hazards of various Industries and latest Technologies to overcome these
6.	Scientific computing with MATLAB	Mech. Eng. Dept., IIT Kanpur	7 th -11 th May 2004	To get knowledge of MATLAB so as to use it in analysis of experimental results
7.	SERC School on Modeling of Industrial Reactors	DST and Chem. Eng Dept IIT Kanpur	12 th -17 th July 2004	To get concepts of modeling of industrial reactors for different types of reactions
8.	QIP Short term course 'Functional Nanomaterials: Science & Technology	IIT Roorkee	3 rd -7 th Feb. 2007	To get concepts of nanomaterials & their uses in various fields
9.	Workshop on Latest developments in NMR and Mass spectroscopy	CDRI, Lucknow	1 st -2 nd Dec.2008	To get knowledge of advances analysis by NMR & Mass spectroscopy
10.	QIP Short term course 'Futuristic	IIT Kanpur	8 th -12 th Dec.2008	To get concepts of nanopolymers & their uses in

	Nanopolymers:			various fields
11.	FDP on Essentials of teaching learning process	Dept. of Humanities	18 th -23 rd March 2013	To learn about methods to improve teaching
12.	FDP on Management and Capacity enhancement for administrations	IIM Lucknow Noida Campus	21 st -25 th Oct. 2013	To get concepts of Management useful for technical institutions
13.	QIP On Intellectual Property Rights	Science & Technology Center, UP CST, Lucknow	17 th -18 th Dec. 2013	To get knowledge of Patents, Copyright, other IPRs
14.	FDP on Engineering Education: Opportunities, challenges & Future Directions	Mechanical Engineering Department a H.B.T.I. Kanpur under TEQIP-II	7 th -12 th March 2014	To get prospects of engineering education and efforts needed to improve it
15.	QIP on Advances in Material Characterization Techniques	QIP CENTRE, I.I.T. Roorkee	30 th May to 3 rd June 2016	To get knowledge of latest techniques and instruments used for characterization of materials
16.	Occupational Safety and Industrial Hazards	Chemical Engineering Department a H.B.T.U. Kanpur under TEQIP-II and ESCI, Institutions of Engineers	3 rd to 5 th October 2016	To get concepts of Safety & hazards Management useful for industries
17.	Energy Conversion and Energy Audit in Academic Institutions	Chemical Engineering Department a H.B.T.U. Kanpur under TEQIP-II and ESCI, Institutions of Engineers	7 th -9 th March 2017	To get concepts of Energy Management useful for Technical Institutions

18.	Basics in Liquid Chromatography	Chemical Engineering Department a H.B.T.U. Kanpur and Waters Ltd.	27 th -28 th March 2017	To learn about methods of using Liquid Chromatography for analysis of chemicals
19.	Training of Trainer Program For Technical Sales Representative QP Code PCS/Q0102 and NSQF level 5	Paint and Coatings Skill Council, India H.B.T.U. Kanpur	22 th -27 th July 2017	To learn about training of Technical Sales Representative For Skill Development
20.	Academic Process for implementation of outcome based Education	H.B.T.U. Kanpur and Thiagrajar College of Engineering, Madurai	19 th - 23 rd Feb. 2018	To learn about Process for implementation of outcome based Education
21.	Outcome based Accreditation for Undergraduate	H.B.T.U. Kanpur and UPTTI kanpur	22 nd - 23 rd March 2018	To learn about Outcome based Accreditation for Undergraduate
22.	Summer Training Program on Active Learning for Senior Faculty	IIT Kanpur	11 th - 15 th June 2018	To learn about curriculum and administration of IIT Kanpur
23.	Technical Education Quality Improvement Programme-III	SPIU, UP MHRD. Govt. Of India	11 th -12 th Sept. 2018	To learn about Outcome based Accreditation for Undergraduate
24.	FDP on Recent Development of Food Processing and Packaging	Dept. of Food Tech. & Dept. of Plastic Tech., H.B.T.U., Kanpur	24th-29th September, 2018	To learn about latest developments in packaging used for variety of food products
25.	'Advancements in Materials Characterization Techniques'	Plastic Technology Department and TEQIP-III HBTU, Kanpur	16-21 December, 2019	Organized as Organizing Secretary and arranged lectures based on latest Characterization techniques
26.	Digital Transformation in Teaching Learning Process	IIT Bombay and TEQIP-III	April 06- 22, 2020	To learn about methods to improve teaching

27.	Impact of Chemistry with Focus on Plastics on Human Life & Scope of Chemistry in Industries		June 21, 2020	To learn about the impact of new technologies on daily life
28.	Challenges in development of Innovative products in India	ATAL incubation Hub, HBTU, Kanpur	July 04, 2020	To learn about innovative products developed by start ups
29.	Use of Nanomaterials in cancer therapy	IEC College Engineering and Technology, Greater Noida	July 06, 2020	To learn about nanomaterial used for cancer treatment
30.	Exposure & Rejuvenation of Technology in Changing era of the World	R K G Institute of Technology	July 06-10, 2020	To learn about new technology for future development
31.	Ancient Indian science and Technology	NITTTR Kolkata and SPIU UP	July 13, 2020	To learn about ancient science related to today's world
32.	NEP 2020- Effective Governance for Higher Educational Institutions	NPIU, TEQIP3 AND SPIU	Feb. 26, 2021	To learn about New Education Policy 2020
33.	Enabling mechanism for continuance of Academic and Governance Reforms beyond TEQIP-III	NPIU, TEQIP3 AND SPIU	March 25, 2021	To learn about Academic governance reforms
34.	Modern Innovations in Chemical Engineering Technology (MICET 2021)	Department of Chemical Engg. and Dept. of Food Tec. HBTU	August 9-13, 2021	To learn about new technologies

Refresher courses organized

1. Worked as one of the co-ordinaters alongwith Dr. G. Bartrya to organize a refresher course on 'Curriculum Development and Evaluation Methods in Technical Education' organized by Plastic Technology Department and Mechanical Engineering Department a H.B.T.I. Kanpur under TEQIP-II from 1st to 6th July 2013
2. Co- chairman in national conference on 'Newer Oleochemicals: Production and Industrial Applications' in the Technical session ' Biofuels and Bio lubricants' during 10-11 January 2015
3. Worked as one of the convener to organize a refresher course on 'Low Cost Plastic Products' organized by Center of Excellence on 'Applied Research Training and Education in Lipid Sciences' of Oil Technology Dept. and Plastic Technology Department of H.B.T.U. Kanpur under TEQIP-II from 4th to 9th July 2016 for skill development of 10th passed students of weaker section of society
3. Was member of organizing committee in the workshop on 'Advancements in Plastic Processing Techniques' on 25th March 2017
4. Worked as one of the convener to organize workshop on "Latest Titration Technique, Ion Chromatography system and Water purification system" sponsored by TEQIP-III organized on 25th September, 2018.
5. Worked as a Organizing Secretary to organize FDP on 'Advancements in Materials Characterization Techniques' sponsored by TEQIP-III organized on 16-21 December, 2019
6. Worked as Chairman in Webinar 'Advanced Polymer Materials for Defence Applications' on 11th September, 2021
7. Worked as Chairman in Webinar 'Single Use Plastics: Challenges and Alternatives' on 28th August, 2021

Invited Talk

Presented a lecture on 'Nano Coatings for Textiles' at FDP on 'Application of Nanotechnology in Textile Technology' held at UP Textile Institute, Kanpur on 18th to 23rd January 2016

Administrative Experience

1. Worked as Warden of Girls Hostel from 2011 to 2015 and March 2016 till date.
2. Worked as Observer and Assistant Superintendent Examination in UPSEE for six years
3. Worked as Assistant Dean R & D from 2013 to 2015
4. Worked as Assistant Superintendent Examination in class test and end semester exams of HBTI from 2008 to 2017
5. Worked as Convener Literary Sub-council of Council of Student Activity since 2010-2016
6. Worked Member of Departmental Purchase Committee of Leather Technology Department and office of Dean R & D
7. Worked as Faculty coordinator for last four years for organization of 'POLYQUORA' a quiz program under the student chapter of departmental association "Polymer Engineers' and Technologists' Association" (PETA)
8. Worked as Member of Library Books Verification Committees and Physical Verification Committees from 1998 to 2018
9. Worked as Member of Registration Committee and Anti-Ragging Committees for many years
10. Worked as Technical Expert in Physical Verification of Technical Upgradation Scheme for MSME from 2016 to 2018.
11. Worked as Technical Expert in Technical Purchase Committee of UP Police for Jungle Boots for Policemen at Kumbh Mela in December 2018.

Fellowship of academic bodies and professional societies

Indian Plastic Institute (IPI)
Society of Polymer Science (SPS),
Indian Society of Technical Education
Association of Paints and Coatings Tech
Oil Technology Association of India

Honours and Awards

Ram Raghuvir Saran Memorial Gold Medal for First rank in the discipline of Plastic Tech. in B. Tech.
Institute Award for First rank in the discipline of Plastic Tech. in M. Tech.

(INDIRA NIGAM)

Annexure I
SUMMARY OF M.TECH. PROJECT

**Title: SYNTHESIS AND EVALUATION OF AN INTERPOLYMER
ANIONIC REVERSE OSMOSIS MEMBRANE DERIVED FROM
POLY(VINYL ALCOHOL) AND POLY(STYRENE SULFONIC ACID)**

Guide: Prof. G.N. Mathur

H No. 117/11, N-Block, KDA Colony,
Kakadeo, Kanpur-208025.

Summary: Reverse Osmosis is widely being used for desalination of water. The cellulose acetate is the most commonly used material for making membranes for desalination. Due to its poor strength, poor compact resistance and biodegradability, a number of new materials have been investigated by scientists for efficient reverse osmosis.

An interpolymer anionic membrane was prepared from poly(vinyl alcohol) as a membrane matrix and poly(styrene sulfonic acid) as an ionic component. The solution casting method was adopted to prepare the membranes. A mixture of water and ethanol, taken in the ratio of 2:1, was selected as a casting solvent. The membrane was formed by casting the polymer solution on a polypropylene film placed on a rimmed glass plate. The solvent was evaporated at 100°C for a proper period ranging from 1 to 3 hours.

An apparatus was also designed and got fabricated to investigate the reverse osmosis performance of the prepared membranes. The whole apparatus was made of stainless steel. The apparatus consisted of a reverse osmosis cell to hold the membrane. A leather sheet was used to support the membrane so that the membrane would withstand the pressure applied during experiments. The effective area of membrane in the cell was 7 cm² and apparatus was designed to operate at pressure up to 300psi.

The effect of composition of casting solution and heat curing period on the reverse osmosis performance of formed membranes was studied. The optimum composition of casting solution was obtained by keeping poly(vinyl alcohol) and poly(styrene sulfonic acid) ratio as 3:2 and 5% polymer concentration in it. The membrane heat cured for a period of 2 hours has given the best performance among all the membranes investigated under applied pressure of 89 psi with 0.25 percent aqueous NaCl solution.

Annexure II

SUMMARY OF DOCTORAL PROJECT

Title: RHEOLOGICAL CHARACTERIZATION OF BLENDS OF POLYCARBONATE WITH VARIOUS POLYMERS

Guide: Prof. G.N. Mathur

H No. 117/11, N-Block, KDA Colony,
Kakadeo, Kanpur-208025.

Summary: A literature survey was done to study the blends of polycarbonate with various polymers and on basis of previous investigations, the blends of Polycarbonate(PC) and ABS[Poly (acrylonitrile butadiene styrene)] and Polycarbonate (PC) and PET[Poly (ethylene terephthalate)] were selected for studies

The flow properties of these blends were studied on Haake System 90 Microprocessor controlled Torque Rheocord. The ABS and PET both were found to improve the flow properties of PC and thus power requirements would be reduced if ABS or PET were blended with PC. The mechanical properties viz. tensile strength, impact strength and physical properties viz. water absorption, density of these blends were determined as per ASTM methods. The mechanical properties of PC were found to suffer with addition of ABS and PET ; the extent depended on the composition of blend. The water absorption of PC was improved by addition of PET and density decreased with addition of ABS thus giving volume/weight advantage. The compatibility of these blends was studied by determining glass transition temperature by TA Instruments Differential Scanning Calorimeter (DSC), and by transitions in viscoelastic properties obtained by TA Dynamic Mechanical Analyzer(DMA) and Rheovibron. The results obtained indicated that the blends of PC/ABS had partial miscibility. The composition containing 10% or more than 70% ABS showed better compatibility as compared to other compositions . In case of PC/PET blends, the blends were found to be immiscible in all compositions although those containing more than 70 % PET showed better phase adhesion as shift in the transitions of two phases towards each other was observed for these blends. The details of phase morphology was studied by Scanning Electron Microscopy. These results were used to obtain macro-micro property correlation for these blends. The conclusions drawn from these investigations were that the blends containing less than 10% ABS had flow properties better than that of PC giving 15 % reduction in viscosity. Although the properties like tensile strength and elongation at break were lost the extent of loss was only 3%. These blends showed higher than additive value of impact strength. The viscoelastic properties as well as glass transition behaviour indicated good compatibility in this composition range which was confirmed by well dispersed phase structures in morphological analysis. These blends can replace PC in applications where tensile strength and water resistance are not critical. The blends of PC/ABS having more than 70% ABS have advantage of about 40% reduction in viscosity and good phase adhesion along with lower cost. These blends with inferior mechanical properties as compared to PC may find limited applications. The blends of PC/PET having more than 70 % PET showed 25% improvement in flow properties with only 8-9% loss in mechanical properties. These blends, having better elongation at break and water resistance as compared to PC can find suitable applications accordingly where humidity resistance is more critical than mechanical properties,

Annexure-III

Professional Experience

[I] Research Experience

1. Worked as Research Assistant on a Project 'Enhancement of Heat Transfer via Turbulence Promotion of In-line Propellers' aDepartment of Chemical Engineering, Indian Institute of Technology, Kanpur for one year. The job responsibility included literature survey related to various methods for enhancement of heat transfer in heat exchangers, designing, implementation and standardization of experimental set-up.
2. Two years of research experience as post-graduate student (M.Tech.) which includes one year research work on project entitled 'Synthesis and evaluation of an Interpolymer Anionic Reverse Osmosis membrane derived from poly (vinyl alcohol) and poly (styrene sulfonic acid).(Annexure I).
3. Four year of research experience as doctoral student and as Senior Research Fellow of CSIR New Delhi. The title of project was 'Rheological Characterization of Blends of Polycarbonate with various Polymers ' (Annexure II)

[II] Industrial Experience

1. Two years of experience of working at Krishna Engineering Pvt. Ltd. Kanpur as Technical Manager. The job responsibility included looking after day to day production. Quality control and inspection of various engineering plastic components produced for LML Pvt. Ltd. and Indian Railways on Injection Moulding Machines. Supervised research and development projects of RDSO, Lucknow and Defence regarding substitution of traditional materials like glass, with plastics and worked for approval of company from RDSO for supply of these components to Indian Railway.
2. Five months experience of working as Research Engineer at Thapar Corporate R&D Centre, Patiala. Job responsibility included handling of projects sponsored by corporate industries of Thapar group viz Crompton Greaves Ltd., Greaves India Ltd. and Baarpur Industries Ltd. The project was based on problems related these industries. During this tenure visited NAL Bangalore for reviewing the development of a project based on Nomex Papers used in transformers and delivered a lecture entitled 'Substitution of Metals with Plastics' at HRD programme organized by Crompton Greaves Ltd, Mumbai on 6-8 Aug. 1995.

[III] Academic Experience

1. Teaching experience at Department of Plastic Tech. for about eighteen years (October 1995 to till date). During this period taught various subjects in the curriculum of B.Tech. course in Plastic Tech (Chemical Tech.) Supervised various laboratory classes of B.Tech. Plastic Tech. Students, in which experiments based on synthesis, characterization, processing and testing of polymers

are done.

2. Participated in examination of B.Tech. Plastic Tech. students as paper setter, invigilator and evaluator of answer books and as internal examiner in various practical examination.
3. Modified syllabus of B.Tech. Plastic Tech course time to time at departmental level.
4. Arranged industrial training for pre-final year students of B.Tech. Plastic Tech. students in various relevant industries/organizations.
5. Acted as member of anti-ragging team
6. Acted as member of verification team for stock verification in Central Library, World Bank scheme and various departments of the institute.
7. Participated as executive member in various committees in the organization of Polycon 2002 held at Plastic Technology Department, HBTI in Sep.2002
8. Delivered lecture on 'High Performance Engineering Thermoplastics' at Short Term Course on High Performance Polymers Materials' at CEP DRDO at DMSRDE Kanpur 9-13th Nov. 1998.
9. Delivered lectures on 'Thermosetting resins for FRP' at a short terms course on FRP-training Programme' at STEP-H.B.T.I., from Dec. 21st 1998 to 16th Jan. 1999.
10. Delivered lectures on various topics at IRDT and STEP, H.B.T.I., from time to time.
11. Coordinated a short term course on "HOUSE HOLD ADHESIVES" conducted by STEP-H.B.T.I. from 18th April 2002 to 18th June 2002.
12. Delivered lectures on 'Composite Materials for Defence Applications' at CEP DRDO at DMSRDE Kanpur, 27th September 2004.
13. Delivered lectures on Polymerization Engineering' at CEP DRDO at DMSRDE Kanpur, In 21st November 2004.
14. Delivered lectures on .Microemulsion Polymerization' at CEP DRDO at DMSRDE Kanpur, In 25th November 2009.
15. Delivered lecture on 'Nano coatings on Textile surfaces' at FDP on Application of Nanotechnology in Textile Engineering from Jan 18-23 2016 organized by UPTTI, Kanpur

[IV] Administrative Experience

1. Working as Assistant Superintendent Examination in class test and end semester exams of HBTI from 2008 till date
2. Working as Observer and Assistant Superintendent Examination in UP SEE for last six years
3. Worked as Warden at girls hostel from 2011 to 2015 and March 2016 till date
4. Worked as Convener Literary Sub-council of Council of Student Activity since 2010-2016
5. Worked as Assistant Dean Research & Development from 2013 to 2015

[V] Research Supervision Experience

1. Guided one M.Tech. Student as a co-guide on the project entitled "Studies on Blends of ABS/PVC" in 1996-97.
2. Guided three students for Ph.D.
 - (i) Ms. Suman Kumari.
Topic of her research was 'Studies on Synthesis of Modified Copolymer of

Styrene and Maleic Anhydride'.

Co-guide: Late Prof. D Agarwal Paint Tech Dept.,H.B.T.I. Kanpur

The thesis has been awarded by U.P. Technical Univ. Lucknow.

(ii) Ms. Sweta Bajpai,

Topic of her research was 'Effect of Higher Acrylates on the Synthesis and Characterization of Crosslinkable Copolymers of MMA and Diacrylate/Dimethacrylates'.Anhydride'

Co-guide: Prof J.S.P.Rai, Plastic Tech Dept., H.B.T.I. Kanpur

The thesis has been awarded by U.P.Technical Univ. Lucknow.

(iii) Ms. Rashmi Katiyar

Topic of her research was 'Fullerene containing Polymers :Synthesis and Characterization r'

Co-guide: Dr. D.S. Bagh, Scientist D,DMSRDE, Kanpur

The thesis has been awarded by U.P.Technical Univ. Lucknow.