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CAREER OBJECTIVES AND EXPERTISE

Research scientist position in Polymer Materials

Supramolecules / Liquid crystals

Synthetic organic chemistry, Nanomaterials and optical characterization of polymers

SKILLS

- Designing and execution of multi step polymer synthesis.
- Experience in preparing and handling of air and moisture sensitive reagents.
- Isolation, purification and characterization of reaction products by chromatographic, spectroscopic (FT-IR, NMR, UV-VIS), HPLC, GC, TGA, DSC, XRD, AFM, Optical polarizing microscope and SNOM.
- Problem solving and quick learning abilities.
- Well versed working ability with multidisciplinary team and also independently.
- Trained and supervised postgraduate and research students in polymer chemistry.
- Computer skills: MS Office and Chem Office.

EDUCATION

- **Ph.D., Polymer Chemistry, 2003**
Thesis title: 'Studies on Azobenzene based organophosphorus liquid crystalline polymers.' Anna University, Chennai, India.
- **M.Sc., Chemistry, 1997**
Government Arts College, Bharathiyar University, Coimbatore, India.
- **B.Sc., Chemistry, 1995**
Government Arts College, Bharathiyar University, Coimbatore, India.

PROFESSIONAL EXPERIENCE

1. **June 2006-Present Indo-Italian exchange fellow(post-doctoral programme)**
Titles: Optical characterization of Azobenzene polymer films and Nanomaterials using Scanning Near-field Optical Microscope (SNOM). University of Pisa, Italy. Azobenzene co polymethacrylates are coated on glass/quartz substrates with the thickness of around 100nm. The thickness is confirmed by the AFM. The samples are being investigated under suitable laser light with optical fiber, which leads for the application of Nanolithography.
2. **April 2005 – March 2006**
Postdoctoral Research Scientist, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki 305-8565, Japan.
Title: Separation of polyester and cellulose from the conventional cloth by acid hydrolysis.
Since the garments wastage all around the world remains millions of tonnes, it is useful to study the separation of cotton from the cotton and polyester blends by mineral acid hydrolysis. During the initial stage of this project I could get the result of separation of cotton from the blend close to 60% of the initial content. The separated cotton is planned to reuse for the application of filters, nanomaterials etc.

3. **Aug 2003 – March 2005**

Postdoctoral Research Scientist, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Ibaraki 305-8565, Japan.

Title: Photochemical study of Azobenzene containing cholesteric liquid crystals. Working on the synthesis of liquid crystalline materials incorporating cholesteric moiety for the tuning of color information media.

As we all know the cholesteric materials are having broad absorption. By inserting a structurally similar molecule to this unit, the pitch distance could be changed, in return the absorption also changed. By designing and synthesizing such a molecule lead to a change in the absorption towards our required wavelength. Based on this the tailor made absorption has been obtained.

4. **Oct 2000 – July 2003**

Senior Research fellow, Department of Chemistry, Anna University, Chennai, India.

Title: ‘Studies on Azobenzene based organophosphorus liquid crystalline polymers’

The research work involves the first report of synthesis and characterization of novel Azobenzene based organophosphorus liquid crystalline polymers and deals with structure-property relationship. Analysis of mesogenic behavior of Azobenzene Derivatives and substituent effects of side-chain azobenzene containing polyphosphates. Thermal characterization of the polymers using TGA, DSC, and Polarizing microscope. Analysis of *trans-cis* photoisomerisation behavior of the polymers using the UV-visible absorbance spectroscopic techniques.

5. **Sep 1998 – Sep 2000**

Junior Project Fellow, Department of Chemistry, Anna University, Chennai, India.

‘Removal of heavy metals from polluted water through organophosphorus chelating resins.’

Polypiperazines were prepared and it was subjected to the metal complexation. And it was tested with the polluted water which yielded the divalent metal ion in the form of metal complexes.

6. **May 1997 – August 1998**

Palakkad chlorate and allied chemicals Pvt limited Kerala, India

Research and development chemist: The activated carbon standards were measured and maintained to (BIS) Bureau of Indian Standards level for a newly formed company. Handled with fewer employees in the industry.

AWARDS

Awarded Senior Research Fellowship, CSIR, Government of India. (May 2003)

PUBLICATIONS

1. **Kumaresan S** and Tamaoki N. “Photochemical Studies of Unsymmetrical Di-mesogens having Azo-benzene and cholesteryl moiety” J. Mater. Resear., Vol.20, No.12, (2005).

2. **Kumaresan S.** and Kannan P, 'Studies on Effect of Ethylphosphate in Azobenzene Containing Thermotropic Liquid Crystalline Polymers.' J. App. Polym. Sci. Vol.91, pp.455-462,(2004)
3. **Kumaresan S.** and Kannan P, 'Synthesis and characterization of poly(piperazinyphosphorimine) and its metal complexes in aqueous medium.' Ind. J. Chem. Tech., Vol.10, pp. 180-185, (2003).
4. **Kumaresan S.** and Kannan P, 'Substituent effect on Azobenzene-based liquid-crystalline Organophosphorus polymers.' J. Polym. Sci., Part. A: Polym. Chem. Vol. 41, pp 3188-3196, (2003).
5. Ramesh Babu R, **Kumaresan S.**, Vijayan N, Gunasekaran M, Gopalakrishnan R, Kannan P, Ramasamy P, 'Growth of 4,4'-dihydroxyazobenzene (DHAB) and its characterization, J. Cryst. Growth 256, 387-392, (2003).

CONFERENCES

1. Ouchi.A, Toida.T, **Kumaresan.S.**, Ando.W (2007) "Development of a Simple Method for the Separation of Polyester/ Cotton Mixed Fabrics" Annual meeting of the Society of Fiber Science and Technology, Tokyo, Japan,.
2. Ouchi A, **Kumaresan S.**, Ando W (2006) "Simple Method for the Separation of Polyester and Cotton from Mixed Fabrics. The 86th Chemical Society of Japan, National Meeting, (Funabashi).
3. **Kumaresan S** and Tamaoki N (2005) "Liquid Crystalline phases of Unsymmetrical Dimesogens having alkyloxyazobenzene, Alkylazoxybenzene and cholesteryl moiety" Nano@Micro: Innovations for Nanoarchitectonics- NAMINA-2005` pp.64, Nanoarchitectonics Workshop, AIST, Tsukuba, Japan.
4. **Kumaresan S** and Tamaoki N (2005) "Cholesterol-azoxybenzene/alkyloxyazobenzene Containing dimesogens and its thermal, photo optical properties" International symposium on Molecular Smart System, March16-17, AIST, Tsukuba, Japan.
5. **Kumaresan S** and Kannan P (2002) 'Synthesis and Characterization of Novel MC-SC-LC Azo Polymers Containing Phosphorus units,' International seminar on frontiers of polymer science and Engineering Macro 2002 pp. 311-314.
6. **Kumaresan S.**, Ramasamy P and Kannan P, Rameshbabu R, Vijayan N, Gunasekaran M and Gopalakrishnan R (2002) 'Growth and characterization of 4,4'-dihydroxy azobenzene (DHAB) single crystals' DAE-BRNS national laser symposium' pp. 476-477.
7. **Kumaresan S** and Kannan P (2000) 'Novel water soluble poly(vinyl piperidinyl phosphorimidic ester)and it's metal complexes' Recent advances in polymers and composites pp. 170-174.
8. **Kumaresan S.**, Senthil S and Kannan P (2001)'Removal of heavy metals using water soluble poly(vinyl piperidinyl phosphorimidic ester)-metal complexes' National conference on control of industrial pollution and environmental degradation'pp. 99-102.

Personal details

Nationality : Indian
 Sex : Male
 Date of Birth : 07.05.1975
 Languages : Tamil, English, Japanese (Primary), Italian (primary)
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 Coimbatore – 641201. Phone: 0091-422-2655439.