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**Patents:**

**1. Electrolysis of Starch based Electrolyte**

*(Neelam Srivastava, Manindra Kumar, Tuhina Tiwari);*

*Application Number-1664/DEL/2012 filed on 31.5.2012 (under Examination)*

**2. Low Cost Electrolyte Membranes for Microbial Fuel Cell Application Synthesized by**

*Complexing Starch (Wheat, Corn and Rice) with Salt*

*(Neelam Srivastava, Manindra Kumar, Madhavi Yadav, Jagdish Kumar Chauhan, Dr. S Venkata Mohan, Naresh, Om Prakash);*

*Application Number-201611006732 filed on 26/02/2016*

*(Complete specification submitted)*

**Research Projects:**

<b>Project Title</b>	<b>Funding Agency</b>	<b>Amount</b>	<b>Duration</b>
Development of sodium ion conducting Zwitterionic polymer electrolyte for electrochemical application	DST, New Delhi	25 lacs	30/09/2008 to 29/08/2012
Synthesis & Electrical Characterization of Starch based Electrolyte System"	UGC, New Delhi	14 lacs	1.6.2013 to 30.5.2016
Study of Potato starch and Magnesium salt based Biodegradable Polymer Electrolyte systems	UP CST, Lucknow	6.8 lacs	August 2016 to July 2018

**Fellowship/Associate ship:**

INSA Visiting Scientist Fellowship (2014-15)-30<sup>th</sup> Nov 2014 to 31<sup>st</sup> Jan 2015

**Reviewer for journals:** Carbohydrate Polymers, Physical Chemistry Chemical Physics, Ionics, Phase Transition, JAPS, Journal of Physical Chemistry, eXPRESS Polymer etc.

### **Memberships of Professional Bodies:**

- a. Life member “Indian Solid State Ionic Society”
- b. Life member “Indian Physics Association” (No-VAR/LM 12845)
- c. Life member “The Indian Science Congress Association” (No-L18884)
- d. Life member “Materials Research Society Of India” (No-LMB2010)
- e. FATER Academy of India

### ***Conference/ Workshop/ Refresher Courses Related:***

#### **Programs Organized as Convener for School and Undergraduate students:**

- Centenary Year One Day Research Motivation Workshop for Undergraduate Students,  
(Regular lecture series -at least 5 to 6 lectures pr years for motivating the under graduate students for R&D)
- Beti Padhao: Centenary Year One Day Research Motivation Workshop for Female Students  
(A regular Series)

#### **Organizing Secretary:**

- *National Conference on Experimental Tools for Material Science Research: State of Art held during 3-4 December 2010.*
- *National Conference on the Relevance of Gandhi and His Timeless Legacy held during March 20-21, 2012.*

#### **Member of Conference Advisory Committees:**

- *International Conference On Science And Engineering Of Materials Sharda University Greater Noida, 6-8 January 2018- National Advisory Committee*
- *International Conference on Macromolecules: Synthesis, Morphology, Processing, Structure, Properties and Applications (ICM-2016) held at M G University Kottayam during 13-16<sup>th</sup> May 2016- National Advisory Committee*
- *International Conference on Science and Engineering of Materials (ICSEM – 2014) held at Sharda University, during 6 - 8<sup>th</sup> January 2014- National Advisory Committee*

- *5<sup>th</sup> International Conference on Functional Materials & Devices (ICFMD-2015) Held at Johar Bahru Malaysia during 4-6 August 2015-International Advisory Board*
- *National Conference On Frontiers Of Chemistry And Materials (NCFCM-2015) - National Advisory Committee*

**Contribution to Asian Workshop Lab Manuals:**

- i) Lab Manuals for the Training Workshop of Third Asian Conference (1992)
- ii) In the Lab Manuals for the Training Workshop of Sixth Asian Conference (1998)

**Resource Person:**

1. Delivered two lectures in Refresher Course in Physics-Astrophysics (Multi Disciplinary) at UGC- Academic Staff College, Kumaun University, Nanital.
  - a) Ion Dynamics by Impedance data
  - b) Recent Trends in Polymer Electrolytes
2. Demonstrated some experiments in Sixth Asian Conference on Solid State Ionics and Research & Training Workshop (1998) Delhi, India.

**Invited Talks:**

- i) National Conference on materials and Devices (NCMD2018) Sharda University Greater Noida, 31<sup>st</sup> July -1<sup>st</sup> August 2018 "*Salt modified starch systems: a flexible free standing economical membranes for electrochemical applications*"
- ii) International Conference on Science and Engineering of Materials Sharda University Greater Noida, 6-8 January 2018 "*An Environmentally Sustainable Electrolyte For Energy Devices*"
- iii) 12<sup>th</sup> **National** Conference of Indian Solid State Ionics Society, BITS Pillani, 21-23 **Dec 2017** "*Starch Electrolytes: The possibilities and limitations*"
- iv) 15<sup>th</sup> Asian Conference on Solid State Ionics (ACSSI-2K16), IIT Patna, 27-29 Nov 2016 "*Salt Modified Starch Systems: Promising Future Electrolytes*"
- v) Pre conference workshop 15<sup>th</sup> Asian Conference on Solid State Ionics (ACSSI-2K16), IIT Patna, 24-26 Nov 2016 "*Analyzing The Conductivity Spectra*"
- vi) 11<sup>th</sup> **National** Conference of Indian Solid State Ionics Society, Tezpur University, **Dec 2015** "*Understanding The Ion Dynamics Of Polymer Electrolytes From Impedance Spectroscopy*"

- vii) 5<sup>th</sup> **International** Conference on Functional Materials & Devices (ICFMD-2015) (**4-6 August 2015**) *“Analyzing The Conductivity Power Law”*
- viii) **International** conference on science and engineering of materials (**6-8 Jan 2014**) Sharda University, Greater Noida, India.  
*“Conductivity Power Law & Ion Dynamic Studies of Polymer Electrolytes: An Experimental Investigation”*
- ix) **National** Conference on Application of High Pressure Techniques and Novel Materials in the Frontier of Science (**25-26, October 2013**) National Centre of Experimental Mineralogy and Petrology, University of Allahabad, India  
*“Polymer salt complexes: Ion dynamics studies using conductivity power law”*
- x) Third **International** Multicomponent Polymer Conference (IMPC) (**23-25 march 2012**) Centre for Nanoscience and Nanotechnology (CNN), Mahatma Gandhi University, Priyadarshini Hills P.O, Kottayam, Kerala, India  
*“Starch Based Polymer-salt composite electrolytes: A promising field”*
- xi) **National** Conference on Recent Trends in Exotic materials (**26-28 August 2010**) School of Engineering & Technology, Sharda University, Greater Noida  
*“Starch as Host for Polymer Salt Complex Electrolytes”*
- xii) Workshop on Experimental tools for characterization of Novel Materials (**9-10 Feb. 2011**) National centre of Experimental Mineralogy and Petrology, University of Allahabad, Allahabad and The National Academy of Sciences, India, Allahabad (Allahabad Chapter)  
*“Impedance Spectroscopic Measurements for Superionic Materials”*
- xiii) **National** Conference on the application of Material Science (**12-13 Sept 2009**, CMP Degree college, Allahabad, India)  
*“Starch: A Delicate But Promising Host for Polymer-Electrolytes*
- xiv) **National** Conference on the application of Material Science (**5 & 6 Feb 2008**, CMP Degree college, Allahabad, India)  
*“New Trends in Polymer Electrolytes”*

## List of Publications

### Publications in Refereed Journals

1. Supercapacitive performance analysis of low cost and environment friendly potato starch based electrolyte system with anodized aluminium and teflon coated carbon cloth as electrode; Madhavi Yadav, Manindra Kumar, **Neelam Srivastava\***; *Electrochimica Acta* 283 (2018) 1551-1559; <https://doi.org/10.1016/j.electacta.2018.07.060>
2. Effect of NaClO<sub>4</sub> concentration on electrolytic behaviour of corn starch film for supercapacitor application; Jagdish Kumar Chauhan, Manindra Kumar, Madhavi Yadav, Tuhina Tiwari, **Neelam Srivastava\***; *Ionics* (May 2017) DOI 10.1007/s11581-017-2136-4
3. Arrowroot + NaI: A low cost, fast ion conducting Eco-friendly polymer electrolyte system; Tuhina Tiwari<sup>#</sup>, Jagdish Kumar Chauhan<sup>#</sup>, Madhavi Yadav, Manindra Kumar, **Neelam Srivastava\***; *Ionics* (Feb 2017) DOI: 10.1007/s11581-017-2028-7
4. Wheat Starch + NaI: A high conducting environment friendly electrolyte system for energy devices ; Madhavi Yadav, Manindra Kumar, Tuhina Tiwari, **Neelam Srivastava\*** ; *Ionics* (Dec 2016); doi:10.1007/s11581-016-1930-8
5. Ion dynamics and relaxation behavior of NaPF<sub>6</sub> doped polymer electrolyte systems **Neelam Srivastava\*** and Manindra Kumar; *Journal of Solid State Electrochemistry* 20, 1421-1428, (2016); DOI: 10.1007/s10008-016-3147-1
6. Conductivity and dielectric investigation of NH<sub>4</sub>I doped synthesized polymer electrolyte system, Manindra Kumar and **Neelam Srivastava\*** ; *Ionics* 21(5): 1301–1310 (2015) (DOI: 10.1007/s11581-014-1294-x)
7. Understanding the ion dynamics and relaxation behavior from impedance spectroscopy of NaI doped Zwitterionic polymer system, Manindra Kumar, Tuhina Tiwari, Jagdish Kumar Chauhan and **Neelam Srivastava\*** ; *Materials Research Express* 1 (2014) 045003 (doi:10.1088/2053-1591/1/4/045003)
8. Ion Transport Properties of NaPF<sub>6</sub> & NaCl doped Poly (N phenylene N'imino pentyl) imminium propane sulfonate, Tuhina Tiwari, Nazia Tarannum, Manindra Kumar, **Neelam Srivastava\***; *Ionics* 21(5): 1301–1310 (2015) (DOI: 10.1007/s11581-014-1097-0)
9. Investigation of electrical and dielectric properties of NaI doped synthesized systems Manindra Kumar, **Neelam Srivastava\***; *Journal of Non-Crystalline Solids*, 389, 28–34(2014)
10. Electrical transport study of potato starch-based electrolyte system- II; Tuhina Tiwari, Manindra Kumar, **Neelam Srivastava\*** and P. C. Srivastava; *Materials Science & Engineering B*, 182, 6–13(2014)
11. Ion dynamics behavior in solid polymer electrolyte,

Manindra Kumar and **Neelam Srivastava\***; Solid State Ionics Volume 262, 806–810 (2014), DOI: 10.1016/j.ssi.2013.10.026

12. Ion dynamics study of Potato starch + Sodium salts electrolyte system; Tuhina Tiwari, **Neelam Srivastava\***, and P.C. Srivastava; *International Journal of Electrochemistry*, Volume 2013, Article ID 670914, (2013)
13. Diffusion limited aggregation in Potato Starch and Hydrogen Borate electrolyte system, Tuhina Tiwari, Manindra Kumar, Kamlesh Pandey, **Neelam Srivastava\*** and P. C. Srivastava; *Advances in Condensed Matter Physics*, Volume 2013, Article ID 781058, 7pages (2013)
14. Electrical Transport Behavior of Bio-Polymer Electrolyte System: Potato Starch+ Ammonium Iodide: Manindra Kumar, Tuhina Tiwari and **Neelam Srivastava\***; *Carbohydrate Polymers* 88, 54-60 (2012)
15. Effect of glutaraldehyde on electrical properties of arrowroot starch + NaI electrolyte system ;Tuhina Tiwari, K. P. Pandey, **Neelam Srivastava\***and P.C. Srivastava; *Journal of Applied Polymer Science* 121 (1), 1, (2011)
16. Electrical Transport Study of Potato Starch Based Electrolyte System; Tuhina Tiwari, **Neelam Srivastava\***and P.C. Srivastava; *Ionics*, 17, 353 (2011)
17. New Trends in Polymer Electrolytes: A Review **Neelam Srivastava\***, Tuhina Tiwari; *e-Polymers* 146, 1, (2009)
18. Electrical properties of the CdS dispersed ammonium alum Composite solid electrolyte; Kamal Devlal\*, U.C. Johri, **Neelam Srivastava** and B. Bhattacharya, *Indian Journal of Physics* 79 (11), 1275 (2005)
19. Studies on A new Proton Conducting Polymer: Poly (Ethylene Succinate) +NH<sub>4</sub>ClO<sub>4</sub>, **Neelam Srivastava**, S. Chandra\*, *European Polymer Journal* 36, 421 (2000)
20. Ion Transport studies in Poly (Ethylene Succinate) +NH<sub>4</sub>ClO<sub>4</sub>, System, **Neelam Srivastava**, S. Chandra\*; *Physica Status Solidi* 163, 313 (1997);
21. Studies on Dense Branched Growth of (SCN)<sub>x</sub> and Ion Transport in PEO +NH<sub>4</sub>SCN Polymer Electrolyte; **Neelam Srivastava**, A. Chandra, S. Chandra\*, *Physical Review B* 52(1), 225 (1995)
22. Proton conducting Polymer electrolyte: II Poly (Ethylene Oxide) +NH<sub>4</sub>I system, K.K. Maurya, **Neelam Srivastava**, S.A. Hashmi, S. Chandra\*, *Journal of Material Science* 27, 6357 (1992)
23. Electric Properties of GdCrO<sub>3</sub> Ceramic,

H. B. Lal\*, Kanchan Gaur, R D Dwivedy, **Neelam Srivastava**, *Journal of Material Science Letters*, 8, 1085 (1989)

24. Pyro-Electric and Dielectric Properties of Europium Orthochromite,  
H. B. Lal\*, Kanchan Gaur, R D Dwivedy, **Neelam Srivastava**, *Journal of Material Science Letters* 8, 1434 (1989)

### **Chapters in books**

1. Corn Starch+Sodium Iodide: A New Biopolymer Electrolyte System  
Jagdish Kumar Chauhan, Manindra Kumar, Tuhina Tiwari, Neelam Srivastava  
*Electroactive Polymers: Materials & Devices-V*, 234-242, **2015**
2. Electrical Transport Studies of A Novel Zwitterionic Polymer Electrolyte,  
Tuhina Tiwari, Nazia Taruunam, Meenakshi Singh and **Neelam Srivastava\***  
*Electroactive Polymers: Materials & Devices-IV*, 235-246, **2012**

### **Publication in International Conference proceedings**

1. Semiconductor Dispersed Polymer Electrolyte Composite,  
B. Bhattacharya, A. Chandra, **Neelam Srivastava**, S.Chandra\*,  
*Solid State Ionics: Science and Technology*, eds B.V.R. Chowdari et al 189, **1998**
2. Effect of Plasticizers on Poly (Ethylene Succinate) +NH<sub>4</sub>ClO<sub>4</sub> System ,  
**Neelam Srivastava**, S. Chandra\*,  
*Solid State Ionics: New Developments*, ed. B.V.R. Chowdari et al 411, **1996**
3. Ion and Hole Transport in Poly (Ethylene Succinate) + NH<sub>4</sub>ClO<sub>4</sub> system,  
**Neelam Srivastava**, S.A. Hashmi, S. Chandra\*,  
*Solid State Ionics: Material and Application*, ed. B.V.R. Chowdari et al 561, **1992**

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