

**Dr. Yugal Kishor Mahipal**

**Cell: (+91) 7772835465 ; +91-9407702398**

**+91-771 2263016**

**E-mail: [ykmahipal@gmail.com](mailto:ykmahipal@gmail.com);**

Designation: Asst. Professor (Contract)

SoS in Physics & Astrophysics,

Pt. RSU, Raipur – 492010, CG



---

**Past: Post – Doctoral Research Fellow (PDRF);** Center for Ionics, Dept. of Physics, University of Malaya, Kuala Lumpur – 50603, (Since March 21, 2014 to September 20, 2015)

- **Research Associate in Pt. Ravishankar Shukla University, Raipur (INDIA).**

(January 10, 2013 – February 2014).

- **ICTP-TRIL (Training & Research in Italian Laboratory) Fellow, Rome, ITALY (ENEA, Cassacia, Italy) (June 2012- December 2012).**

**Teaching experience: 2009-2012 (M. Phil & Post Graduate teaching as a Ph. D. fellow)**

**Passport Number : H 2646239 (Date of Expiry: 14/04/2019)**

**Subsidiary Topic of Research**

**“Ion Conducting Polymers and Nano-Composites”**

**(Solid State Rechargeable batteries, sensors, supercapacitors, electrolyte materials)**

**Special Research Training/ Experience at IIT Powai, Bombay**

**Educational Qualifications:**

**Ph. D. awarded (Physics, Dec. 26, 2011)** Pt. Ravishankar Shukla University, Raipur,

**Specialization:** Materials Science/Solid State Physics: **(Medium: ENGLISH)**

**Thesis Title: “Investigations on Electroactive Polymer Electrolytes: Synthesis, Characterization and Electrochemical Battery Applications”.**

**Supervisor:** Dr. R. C. Agrawal, (Prof. & Head), SoS in Physics & Astrophysics, Pt. Ravishankar Shukla University, Raipur – 492010, C. G., INDIA

- **M. Sc. (Physics), 2005**, School of Studies in Physics, Pt. Ravishankar Shukla University, Raipur, **(Medium: ENGLISH)**

**Total Published papers in referred journals: 12;**

**Academic Abroad tour:**

- **Canada: Toronto** to participate in the '17<sup>th</sup> Int. Conf. on Solid State Ionics (SSI-17) during June 28-July 4, 2009.
- **Italy: Padova** to participate in the '12<sup>th</sup> International Symposium on Polymer Electrolytes (ISPE-12)', 29 August - 3 September 2010.
- **Poland: Warsaw** to participate in the 18<sup>th</sup> Int. Conf. on Solid State Ionics (SSI-17) during July 3-8, 2011.
- **Italy, ROME (ICTP Research & Training Programme) (June 25 – Dec. 24, 2012).**
- **Malaysia, Post doc, University of Malaya, Kuala Lumpur – 50603 [March 21, 2014 – Sept. 20, 2015].**

### **Research Area/Interest**

#### **Energy Materials and Electrochemical Power Sources (Experience: 10 years)**

- Polymer electrolyte for Rechargeable batteries, supercapacitors and novel electrode material for electrochemical devices.
- Nanostructured oxide materials for cathode applications in magnesium and lithium ion batteries.
- Ionic liquid based gel polymer electrolytes (new generation materials for energy conversion and storage) for batteries and supercapacitors applications.
- Nanostructured conducting polymers (Polyaniline, polypyrrole, polythiophene and their derivatives etc.) and their oxide and carbon composites for supercapacitor applications.
- Ag<sup>+</sup>-ion conducting based Superionic System.

## Annexure A:

### List of Publications:

#### (A) Paper Published in referred Journals

##### List of publications:

1. Effects of ionic liquid on the hydroxypropylmethyl cellulose (HPMC) solid polymer electrolyte, Mee Yoke Chong, Chiam-Wen Liew, Arshid Numan, K. **Yugal, K.** Ramesh, H. M. Ng, T. V. Chong, S. Ramesh, *Ionics* (2016), DOI: 10.1007/s11581-016-1768-0.
2. An Approach to Solid-State Electrical Double Layer Capacitors Fabricated with Graphene Oxide-Doped, Ionic Liquid-Based Solid Copolymer Electrolytes; N. F. A. Fattah, H. M. Ng, **Y. K. Mahipal**, Arshid Numan, S. Ramesh \* and K. Ramesh; *Materials (MDPI)*, 2016 volume 9, pp 450.
3. “Materials and Electrical Property Studies on Polymer Electrolyte Membranes Incorporating with Room Temperature Ionic Liquid”. **Y. K. Mahipal**, R. C. Agrawal, Y. Hanisah, Numan Arshed, S. Ramesh; *Int. J. of Emerging Tech. & Adv. Eng.*, Volume 6 (4) (2016), pp. 18-25.
4. “Enhanced electrochemical performance of cobalt oxide nanocube intercalated reduced graphene oxide for supercapacitor application”. Arshid Numan, Navaneethan Duraisamy, Fatin Saiha Omar, **Y. K. Mahipal**, K. Ramesh and S. Ramesh. *RSC Adv.*, Volume 6 (2016) pp 34894.
5. “Efficiency of supercapacitor using EC/DMC-based liquid electrolytes with methyl methacrylate (MMA) monomer”, N. S. Nadiah, **Y. K. Mahipal**, Arshid Numan, S. Ramesh, K. Ramesh, *Ionics (Springer)*, Voume 22 (1) (2016), pp. 107-114.
6. “Investigations on ion transport properties of hot-press cast magnesium ion conducting Nano-Composite Polymer Electrolyte (NCPE) films: Effect of filler particle dispersal on room temperature conductivity”, R.C. Agrawal\*, Dinesh K. Sahu, **Y. K. Mahipal**, Rehana Ashrafi, *Materials Chemistry and Physics*, Volume 139 (2013), pp. 410-415
7. “Materials and ion transport property studies on hot-press synthesized solid polymer electrolyte membranes: (PEO: KIO<sub>3</sub>)” R. C. Agrawal\*, **Y. K. Mahipal**, Rehana Ashrafi, *Solid State Ionics (North Holland)*, Volume 192 (2011), pp 6-8.
8. “Study of electrical and electrochemical behavior on hot-press synthesized nano-composite polymer electrolyte membranes: 70PEO: 30 KNO<sub>3</sub> + x SiO<sub>2</sub>” R. C. Agrawal\*, **Y. K. Mahipal**, *J. Electrochemical Science*, Volume 6 (2011), pp. 867-881.
9. “Study of ion transport behaviour in a mechanochemically synthesized silver halide mixed composite system: [0.75 AgI: 0.25 AgCl]” R.C. Agrawal\*, **Y. K. Mahipal**, Dinesh Sahu, Geeta Shrivias, *J. Non- Crystalline Solids*, Volume 357 (2011), pp. 3670-3674.

10. "Ion transport property studies on PEO–PVP blended solid polymer electrolyte membranes" Angesh Chandra, R. C. Agrawal, **Y. K. Mahipal**, J. Phys. D: Appl. Phys. J. Phys. D: Appl. Phys., Volume 42 (2009), pp. 135107.
11. "Ion Transport and Battery Discharge Characteristic Studies on Hot-press synthesized Ag<sup>+</sup>-Ion Conducting Nano Composite Polymeric Electrolyte: (1-x) [90 PEO: 10 AgNO<sub>3</sub>]: x SiO<sub>2</sub>"- R.C. Agrawal\*, Angesh Chandra, Alok Bhatt, **Y. K. Mahipal**, New. J. Physics, Volume 10 (2008), pp. 043023.
12. "Characterization of ion transport property and study of solid state battery discharge performance on newly synthesized Ag<sup>+</sup> ion conducting quaternary solid electrolyte systems: x [0.75AgI: 0.25AgCl] : (1-x) KI" - R. C. Agrawal\*, Angesh Chandra, Alok Bhatt, **Y. K. Mahipal**, European Physical Journal: Applied Physics, Volume 43 (2008), pp. 209.
12. "Investigations on electrical and electrochemical properties of Ag<sup>+</sup>- ion conducting quaternary solid electrolyte systems: x [0.75AgI:0.25AgCl] : (1-x) RbI" - R. C. Agrawal\*, Angesh Chandra, Alok Bhatt, **Y. K. Mahipal**, J. Phys. D: Applied Physics, Volume 40 (2007), pp. 4714

\*Corresponding Author: R. C. Agrawal; E-mail: [rakesh\\_c\\_agrawal@yahoo.co.in](mailto:rakesh_c_agrawal@yahoo.co.in)

### Fellowships Awarded

- **Senior Research Fellowship (SRF)** by University Grants Commission (UGC) **New Delhi, India (Host Institute: Pt. Ravishankar Shukla University, Raipur, C.G., India; From 11 Sept.2009–Dec. 26, 2011).**
- **Junior Research Fellowship (JRF)** by University Grants Commission (UGC) **New Delhi, India (Host Institute: Pt. Ravishankar Shukla University, Raipur, C.G., India (11 Sept. 2007 – 10 Sept. 2009).**

### Awards/Nomination

- **6<sup>th</sup> Chhattisgarh Young Scientist (Physics & Electronic Section), 6<sup>th</sup> Chhattisgarh Young Science Congress** by Chhattisgarh Council of Science & Technology (CCOST), Raipur, Feb. 28-29, 2008.
- **Student Attendee Award by Electrochemical Society, New York, USA** during 18<sup>th</sup> Int. Conf. on Solid State Ionics (SSI-18), Warsaw, Poland, July 3-8, 2011
- **ICTP-TRIL Fellowship – 2012, Rome, Italy.**

### Characterization Techniques (Materials & Devices)

- Ionic conductivity and Interfacial Polarization Resistance by Impedance Spectroscopy (IS).
- Structural properties by FT-IR.
- Thermal properties by DSC.
- Microstructure by SEM, AFM.

- Glove – Box operation
- Electrochemical Impedance Spectroscopy (EIS)
- Various electrochemical characterizations viz. **cyclic voltammetry, linear sweep cyclic voltammetry** **Cyclic charge discharge** etc. using Electrochemical Analyzer.
- Surface area, pore size distribution, pore volume by BET technique (using Macromeritics Instrument)
- Fabrication & characterization of Electrochemical Devices viz. rechargeable batteries, supercapacitors by charge-discharge characteristics (using Arbin Instruments, USA)
- High Energy Planetary Ball Mill.