Dr. Arvind Pandey

Dr. Arvind Pandey, M.Sc., Ph.D.
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He has obtained his PhD in Physics from National Physical Laboratory, New Delhi / Univeristy of Rajasthan, India in 2000 and then worked as a Lecturer, Sr. Lecturer, Assistant Professor and Associate Professor in North Eastern Regional Institute of Science and Technology, Nirjuli, Itanagar, Arunachal Pradesh. Currently, he is working as professor in the department of applied sciences and humanities. His research areas include Solid Ionic Conductors, Nanomaterials for Heavy Metals Remediation from water and Natural Dye sensitized cells (NDSSCs). His research group involved in the synthesis of nano zero-valent iron, magnetite and Lanthanum oxide based low cost nanomaterials for the heavy metal remediation from water via adsorption mechanism. The nanoparticles functionalized with L-Cysteine have found to have enhanced adsorption capacities of heavy metals from water than the bare nanoparticles. The regeneration and reusability of synthesized nanoparticles have been shown, thus, potentially reducing overall cost of operation. We have fabricated natural dye sensitized solar cells (NDSSCs), sensitized with dye Begonia malabarica Lam, reported one of the highest efficiencies under optimum condition in dye sensitized solar cells. He has successfully guided six PhD students.

Publications (last 10 Years)

Journals:

1. Gyati Tachang Tado and **Arvind Pandey**, Conductivity and Phase Transition Study of Sr^{2+} Substituted $La_2Mo_{1.95}V_{0.05}O_{9-\delta}$, Physica Status Solidi B: Basic Solid State Physics. https://doi.org/10.1002/pssb.202000104.

2. Amar Jyoti Saikia, P.S. Mondal and **Arvind Pandey**, Synthesis and characterization of Bi^{3+} and V^{5+} co-substituted $La_2Mo_2O_9$, Phase Transitions, **93 (2)** (2020) 197-206.

3. Diptimayee Tripathy and **Arvind Pandey**, Studies on structural and optical properties and its correlation with the ionic conductivity of the $Bi_2VO_{5.5}$-based oxide ionic conductors, Solid State Ionics, **541** (2019) 115038.

4. Amar Jyoti Saikia, Diptimayee Tripathy, Gyati Tachang Tado and **Arvind Pandey**,

Effect of V^{5+} substitution on structural and electrical properties of $La_2Mo_2O_9$, Physica B, **570** (2019) 133-138.

5. Diptimayee Tripathy, Amar Jyoti Saikia, Gyati Tachang Tado and **Arvind Pandey**, Role of Al and Ti doping in modulating electrical properties of BIVOX system, Journal of Advanced Ceramics, **8(4)** (2019) 489-499.

6. Diptimayee Tripathy, Amar Jyoti Saikia, Gyati Tachang Tado and **Arvind Pandey**, Dielectric study of Ti-doped $Bi_2VO_{5.5}$ solid electrolyte, India Journal of Physics, **93 (7)** (2019) 845-859. https://doi.org/10.1007/s12648-018-1356-4.

7. Diptimayee Tripathy, Amar Jyoti Saikia and **Arvind Pandey**, Effect of simultaneous Ti and Nb doping on structure and ionic conductivity of $Bi_2V_{1-x}Ti_{x/2}Nb_{x/2}O_{5.5-d}$ $(0.1\leq x\leq 0.25)$ ceramics, Ionics **25 (5)** (2019) 2221-2230. https://doi.org/10.1007/s11581-018-2622-3.

8. Diptimayee Tripathy and **Arvind Pandey**, Structural and impedance studies of Ti^{IV} and Nb^{V} co-doped bismuth vanadate system, Journal of Alloys and Compounds **737** (2018) 136-143.

9. Yana Bagbi, Ankur Sarswat, Dinesh Mohan, **Arvind Pandey** and Pratima R. Solanki, Lead and Chromium adsorption from water using L- Cysteine functionalized magnetite (Fe_3O_4) nanoparticles, Scientific Reports **7** (2017) 7672 (1-15).

10. Yana Bagbi, Ankur Sarswat, Sachchidanand Tiwari, Dinesh Mohan, **Arvind Pandey** and Pratima R. Solanki, Synthesis of L-cysteine stabilized zero-valent iron (nZVI) nanoparticle for lead remediation from water, Environmental Nanotechnology, Monitoring & Management **7** (2017) 34-45.

11. Yana Bagbi, Ankur Sarswat, Dinesh Mohan, **Arvind Pandey** and Pratima R. Solanki, Lead (Pb^{2+}) Adsorption by Monodispersed Magnetite Nanoparticles: Surface Analysis and Effects of Solution Chemistry, J. Environmental Chemical Eng. **4** (2016) 4237-4247.

12. Lakshmi K. Singh, T. Karlo and **A. Pandey**, Performance of fruit extract of Melastoma malabathricum L as sensitizer in DSSCs, Spectrochim. Acta, Part A **118** (2014) 938-943.

13. Lakshmi K. Singh, T. Karlo and **A. Pandey**, Electrochemical Impedance Spectroscopic study of anatese TiO_2 nanoparticles, Mater. Sci. Forum **781** (2014) 127-133.

14. Lakshmi K. Singh, T. Karlo and **A. Pandey**, Electrochemical Impedance Spectroscopic Study of DSSC sensitized with Begonia malabarica Lam., Mater. Sci.

Forum 771 (2014) 133-141.

15. Lakhi Nath Borah and **A. Pandey**, Impedance Studies of $La_2Mo_{2-x}Sn_xO_{9-\delta}$ Oxide Ion Conductors, Acta Metall. Sin. (Engl. Lett.) **26** (4) (2013) 425-434.

16. Lakshmi K. Singh, T. Karlo and **A. Pandey**, Begonia dye as an efficient anthocyanin sensitizer, J. Renew. Sust. Energy **5** (2013) 043115-1- 10.

17. Kiran Kathayat, A. Panigrahi, **A. Pandey** and S. Kar, Structural and electrical studies of $Ba_5LaTi_3V_7O_{30}$ compound, J. Electroceram. **28** (2012) 268-274.

18. Lakhinath Borah, B. Paik, S.A. Hashmi and **A. Pandey**, Conductivity and electrical modulus studies of $La_{2-x}Nd_xMo_{1.7}W_{0.3}O_{9-\delta}$ oxygen ion conductor, Ionics **18** (2012) 747-757.

19. Lakhinath Borah, B. Paik and **A. Pandey**, Effect of Ho substitution on the ionic conductivity of $La_2Mo_{1.7}W_{0.3}O_9$ oxygen ion conductor, Solid State Sci. **14** (2012) 387-393.

20. Kiran Kathayt, A. Panigrahi, **A. Pandey** and S. Kar, Effect of Holomium Doping in $Ba_5RTi_3V_7O_{30}$ (R = Rare Earth Element) Compound, Integrated Ferroelectrics **118** (2010) 8-15.

21. Lakhi Nath Borah, Sanjay and **A. Pandey**, Effect of Sn-doping at Mo-site on the conductivity of $La_2Mo_2O_9$ series of compounds, Indian J. Phys. **84 (6)** (2010) 699-704.

Selected Research Papers published in conference proceedings/journals:

1. Yana Bagbi, **Arvind Pandey** and Pratima R. Solanki, Mesoporous Spherical Shaped Silica Nanoparticles for Effective Adsorption of Aqueous Lead (Pb^{2+}), Advanced Science Letters **24 (2)** (2018) 922-926.

2. Yana Bagbi, Ankur Sarswat, Sachhidanand Tiwari, Dinesh Mohan, **A. Pandey** and Pratima R. Solanki, Nanoscale zero-valent iron for aqueous lead removal, Advanced Materials Proceedings **2** (4) (2017) 235-241.

3. Lakshmi K. Singh, T. Karlo and **A. Pandey**, On the Structural, Thermal and Optical properties of Titanium dioxide (TiO_2) nanoparticles, Ind. J. Sci. Technol. **6** (S3) (2013) 55-58. ISSN: 0974-6846.

4. L.K. Singh, T. Karlo and **A. Pandey**, Pomegranate Dye as a Green Energy Material, ICPEN, NERIST, 2012 pp 1-5; DOI: 10.1109/ICPEN 2012.6492312. (IEEE Xplore).

5. Lakshmi K. Singh, T. Karlo and **A. Pandey**, Influence of substrate properties on the efficiency of Dye sensitized solar cells, Int. J. Innovative Res. Dev., **1** (7) (2012)

269-276. ISSN 2278-0211

6. Jugananda Sut, Lakhinath Borah and **A. Pandey**, Synthesis, Structure and Electrical Conductivity of Li- Substituted $Bi_4V_2O_{11}$ Solid Electrolyte, Int. J. Innovative Res. Dev**, 1** (7) (2012) 181-185. ISSN 2278-0211.

7. L. K. Singh, T. Karlo and **A. Pandey**, Dye Sensitized Solar Cells (DSSCs): A Clean Alternative to Conventional Solar Cells, Proceedings of International Congress on Renewable Energy (ICORE-2011), pp 284-291.

8. Lakhinath Borah, Sanjay and **A. Pandey**, Effect of sintering temperature on the dc conductivity of LAMOX series of compounds for solid oxide fuel cell (SOFC) application, Proceedings of Regional Seminar Bio-Fuels in North East India Issues and Prospects, pp 95-100 (2009).

Book chapters

1. Yana Bagbi, **Arvind Pandey** and Pratima R. Solanki, Electrospun Nanofibrous Filtration Membranes for Heavy metals and dye removal, Nanoscale Materials in Water Purification (Elsevier), Ed. Sabu Thomas, Daniel Pasquini, Shao-Yuan Leu and Deepu A. Deepakumar (2019) 275-288, . **DOI** http://doi.org/10.1016/B978-0-12-813926-4.00015-X. (Elsevier).

2. Yana Bagbi, **Arvind Pandey** and Pratima R. Solanki, Role of nanostructured materials towards remediation of heavy metals/mettaloids, Nanomaterials and Their Applications (Springer Nature Singapore Pte Ltd.), Ed. Z.H. Khan, **84** (2018) 73-95. **DOI** https://doi.org/10.1007/978-981-10-6214-8_3.

Projects

S.No.	Title of the Project	Amount	Funding Agency	Status	Investigator/Co-investigator
1.	Synthesis, Characterization and Evaluation of rare-earth based oxygen ion conducting ceramics for Solid Oxide Fuel Cells (SOFCs) applications	Rs. 15 lacs	MHRD, GOI	Completed	PI: A. Pandey Co-PI: Dr. Sanjay and Prof. R.N.P. Choudhary

Teaching Interests

Computational Physics and Programming,
Statistical Mechanics and Electrodynamics
Advanced Numerical Methods and Applied Statistics,
Advanced Engineering Mathematics
Numerical Methods and its Applications

Research Interests

1 Solid Ionic Conductors
2 Nanomaterials for Heavy Metals Remediation from water
3 Natural Dye sensitized cells (NDSSCs)

Ph. D Thesis supervised
Completed:

(a) Studies on synthesis and characterization of some rare-earth based oxygen ion conducting Ceramics (NERIST, Nirjuli)- Lakhinath Borah,Supervisor- Arvind Pandey

(b) Modulating the ferroelectric properties of $Ba_5RTi_3V_7O_{30}$ (R=Ho, Gd, La) By adding $BiFeO_3$- Kiran Kathayat, North Orissa University, Baripada, Orissa, Supervisors- Anuradha Panigrahi, Arvind Pandey & S. Kar

(c) Fabrication and characterization of natural dye sensitized solar cells (NERIST, Nirjuli)– Lakshmi K. Singh, Supervisor- T. Karlo, Co- supervisor- Arvind Pandey

(d) Studies on synthesis and characterization of some bismuth based solid electrolytes for solid oxide fuel cell (NERIST, Nirjuli)- Juganada Sut, Supervisor- Arvind Pandey

(e) Engineered Nanosmaterials for the application in remediation of heavy metal ions (Pb^{2+}, Cr^{6+}) from water (NERIST, Nirjuli)- Yana Bagbi, Supervisors- Arvind Pandey & Co-supervisor- Pratima R. Solanki, SCNS, JNU, New Delhi.

(f) Modulation of Structural, Optical and Electrical Properties of BITIVOX System: Role of Nb and Al doping (NERIST, Nirjuli)- Diptimayee Tripathy, Supervisor - Arvind Pandey

On-going:

1. Gyati Tachang Tado - NERIST, Nirjuli, Itanagar

2. Amarjyoti Saikia - NERIST, Nirjuli, Itanagar