



Arunraj B

arunrajtpr19@gmail.com

www.linkedin.com/in/

arunraj-b-796b64218/

(+1) 515-337-4575

#### Address

321 S 5th St, Unit 213  
Ames, IA  
50010

# Arunraj B. Ph.D

## Analytical Chemist

### Qualification

- Experienced researcher with 7 plus years working in analytical chemistry labs.
- Skilled in synthesis and characterization of inorganic, polymers and layered materials using various instrumentation techniques.
- Focused on separation chemistry topics includes rare earth separation, Environmental chemistry, contaminants removal, remediation and method development.
- Experienced in Density Functional Theory calculations for small molecules and carbonaceous materials.
- Supervisory experience with team members and mentoring graduate and undergraduate students.
- Trained in project and lab budget management, monitoring grant expenditures and ensuring compliance with grant guidelines.

### Research Experience

- Microorganism/biomolecules immobilized on biopolymers/layered materials for the recovery of rare earth elements from e-waste.
- Microbiology techniques such as microbial culturing, staining and microscope studies.
- Batch adsorption process and optimizations of reaction parameters.
- Utilization of analytical and solid state chemistry instrumentation to optimize adsorption process and elucidate interaction mechanism.
- Environmental and e-waste sample preparation and quantification.
- Functionalization of carbon derived from biomass and utilization for desulfurization from model oil.
- Removal of Uranium from ground water using functionalized carbonaceous materials.

### Expertise

**Material synthesis methods:** Solvothermal, solid state, microwave, solution combustion, ultrasound.

**Characterization and interpretation:** P-XRD, XPS, XRF, SEM-EDS, HR-TEM, NMR, TGA and other spectroscopic techniques like UV-vis, FT-IR, Raman, Fluorimetry.

**Material Surface Analysis:** Surface area, pore size and pore volume, BET analysis, surface charge and particle size analysis using Zeta-sizer.

**Separation process:** Designing and conducting batch/column adsorption studies, optimization of adsorption parameters, isotherm, kinetics and thermodynamics studies of adsorption process.

**Quantitative analysis:** Heavy metals and rare earth elements using Atomic Absorption Spectroscopy (AAS), Ion Chromatography (IC), Inductively Coupled Plasma-Mass Spectrometer (ICP-MS); Organic molecules using HPLC, GC, LC-MS.



Arunraj B

arunrajtpr19@gmail.com

www.linkedin.com/in/

arunraj-b-796b64218/

(+1) 515-337-4575

#### Address

321 S 5th St, Unit 213  
Ames, IA  
50010

**Cations and anions detection & analysis:** Ion chromatography with conductivity detector and post column derivatization using UV detector.

**Fluoride and Lead analysis:** Ion selective electrodes (ISE).

**Theoretical chemistry:** DFT calculations for small molecules.

**Computational chemistry, visualization:** Avogadro (molecule designer), VMD, Gauss-view (molecule designer), Gaussian for DFT calculation, Material studio.

## Scientific Publications

1. Kodali J., Puram S., Pavuluri S., **Arunraj B.**, Bajda T., Tomaszewska B., Tseng W. L., Kumar A.S.K. and Rajesh N. C18 functionalized zirconized silica for effective removal of phorate pesticide from agricultural runoff involving ground water remediation. **Groundwater for Sustainable Development**, 23, **2023**, 100993. (IF:5.9)
2. Kodali J., Puram S., Pavuluri S., Nilavu C.M., **Arunraj B.**, Kumar A.S.K. and Rajesh N. Sequestration of Mecoprop herbicide from water using XAD-4 resin impregnated with Aliquat 336 and quantification with Liquid Chromatography-Tandem mass spectrometer (LC-MS/MS). **Separation Science and Technology**, **2023**. (IF:2.8)
3. Nilavu C.M, **Arunraj B.**, Aggarwal H. and Rajesh N. Expeditious microwave assisted green synthesis of phosphorous doped carbon obtained from *Mangifera Indica* for adsorptive desulfurization of fuel. **Fuel**, 345, **2023**, 128172. (IF:7.4)
4. **Arunraj B.**, Rajesh V. and Rajesh N. Potential application of graphene oxide and *Aspergillus niger* spores with high adsorption capacity for recovery of europium from red phosphor, compact fluorescent lamp and simulated radioactive waste. **J. Rare. Earths**, 41(1), **2023**, 157-166.(IF:4.9)
5. Nilavu C.M, **Arunraj B.**, Aggarwal H. and Rajesh N. Ultrasound assisted approach for the desulfurization of model fuel using ionic liquid anchored carbon obtained from *Prosopis juliflora*. **Fuel**, 324, **2022**, 124472. (IF:7.4)
6. Dhanya V., **Arunraj B.** and Rajesh N. Prospective application of phosphorylated carbon nanofibers with a high adsorption capacity for the sequestration of uranium from ground water. **RSC Adv.**, 12, **2022**, 13511-13522. (IF: 3.9)
7. Kodali J., Pavuluri S., **Arunraj B.**, Kumar A.S.K. and Rajesh N. Tapping the potential of a glucosamine polysaccharides- diatomaceous earth hybrid adsorbent in the solid phase extraction of a persistent organic pollutant and toxic pesticide 4,4'-DDT from water. **RSC Adv.**, 12, **2022**, 5489-5500. (IF:3.9)
8. **Arunraj B.**, Kaushik U.S.G., Rajesh V. and Rajesh N. Combinative influence of graphitic carbon nitride and *Halomonas BVR1* bacteria augment the adsorptive recovery of precious 'Euro'pium. **Chem. Eng. J.**, 404, **2021**, 126466. (IF:15.1)
9. Kodali J., **Arunraj B.**, Talasila S., Kumar A.S.K., and Rajesh N. Prospective application of diethylaminoethyl cellulose (DEAE-cellulose) with a high adsorption capacity towards the detoxification of 2,4-dichlorophenoxyacetic acid (2,4-D) from water. **RSC Adv.**, 11, **2021**, 22651. (IF:3.9)



Arunraj B

arunrajtpr19@gmail.com

www.linkedin.com/in/

arunraj-b-796b64218/

(+1) 515-337-4575

#### Address

321 S 5th St, Unit 213  
Ames, IA  
50010

10. Priya M.L.S.N.V, **Arunraj B.** and Rajesh N, Twin-fold new methodology arising from microwave induced carbonization of newspaper waste for the adsorptive desulfurization of model oil. **Fuel**, 299, **2021**, 120873. (IF:7.4)
11. Kodali J., Talasila S., **Arunraj B.** and Rajesh N. Activated coconut charcoal as a super adsorbent for the removal of organo-phosphorous pesticide monocrotophos from water. **Case. Stud. Chem. Environ. Engi.**, 3, **2021**, 100099.
12. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N. Cellulose and *Saccharomyces cerevisiae* embark to recover Europium from phosphor powder. **ACS Omega**, 4(1), **2019**, 940-952. (IF:4.1)
13. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N, Removal of Europium from aqueous solution using *Saccharomyces cerevisiae* immobilized in glutaraldehyde cross-linked chitosan. **Sep. Sci. Tech.**, 54(10), **2019**, 1620-1631. (IF:2.8)
14. Nandini E., **Arunraj B.**, Rajesh N. and Rajesh V. Improved method for urinary p-cresol detection and measurement using high performance liquid chromatography/mass spectrometry. **Heliyon**, 5(12), **2019**, e02978. (IF:4.0)

## Poster Presentations

1. **Arunraj B.**, Rajesh V. and Rajesh N. "Rational sustainable approach utilizing graphene oxide and *Aspergillus niger* spores for the recovery of europium from real samples" DAE Second Symposium on Current Trends in Analytical Chemistry (CTAC-2021), Oct 20-23, 2021, Department of Atomic Energy, Mumbai.
2. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N. "Removal of Europium from aqueous solution using *Saccharomyces cerevisiae* immobilized in glutaraldehyde cross-linked chitosan", 2019, IIT Bombay, Mumbai. **(Shortlisted (Nationwide) in the top 15 contestants chosen for the grand final of IIT Bombay Metrohm Young Chemist Award 2019 for the technical poster presentation of the research paper)**
3. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N. "Synergistic influence of Biopolymer-microbe towards the recovery of Europium-A Precious rare earth metal." 3rd International Conference on Recent Advances in Material Chemistry (ICRAMC-2019), 2019, SRM Institute of Science and Technology, Chennai.
4. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N. "Adsorption of Europium from aqueous aedium using microbe immobilized biopolymers- A comparative study." A two day DAE-BRNS sponsored seminar- Analytical Science at NCCCM: A journey over 25 years. 30th Nov-1st Dec, 2018, NCCCM/Bhaba Atomic Research Centre, Hyderabad.
5. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N. "Quantitative determination of europium (III) by ion chromatography using lactic acid as an eluent." Indian Analytical Science Congress 2018 (IASC-2018), 2018, MG University, Kerala.



Arunraj B

arunrajtpr19@gmail.com

www.linkedin.com/in/

arunraj-b-796b64218/

(+1) 515-337-4575

#### Address

321 S 5th St, Unit 213

Ames, IA

50010

## Oral Presentations

1. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N."Removal of Europium from aqueous solution using *Saccharomyces cerevisiae* immobilized in glutaraldehyde cross- linked chitosan." DAE-BRNS sponsored Eighth Biennial Symposium on Emerging Trends in Separation Science and Technology (SESTEC-2018),2018, BITS Pilani, K.K. Birla Goa Campus, Goa.
2. **Arunraj B.**, Talasila S., Rajesh V. and Rajesh N."Novel Ion chromatographic method for the determination of Europium after its separation from other lanthanides using microorganism immobilized biopolymer adsorbent." International Conference on Recent Trends in Analytical Chemistry (ICORTAC-2018), 2018, University of Madras, Chennai. Note: Received **Best oral presentation award**

## Industrial experience

- **Junior Executive**, May 2015- Jul 2017, Actavis Pharma Development Centre (Teva Company), Chennai, India.

Responsibilities shouldered:

- Conducting the global stability studies for tablets and capsules.
- Performing the physical characterization of Tablets/Capsules like hardness, friability, disintegration, loss on drying, and moisture content (Karl Fischer Titration).
- Performing dissolution studies of Tablets/Capsules and quantification by UV/HPLC.
- Performing assay of Tablets/Capsules by UV/HPLC.
- Performing method development, validation and transfer studies.
- Preparation of SOP (Standard Operating Procedure) and STP (Standard Testing Procedure).

## Education

### Ph.D in Chemistry

01/15/2018 - 07/26/2023, BITS-Pilani, India.

**Thesis title** : Efficacy of Tailored Biopolymer and Carbonaceous Adsorbents for the Recovery of Europium.

Supervisors: **Prof. N. Rajesh** and **Prof. Vidya Rajesh**

### MSc General Chemistry

Jun 2013 - Apr 2015, Madras Christian College, Chennai, India

1<sup>st</sup> Division, CGPA : 6.393

### BSc General Chemistry

Jun 2010 - Apr 2013, Madras Christian College, Chennai, India

2<sup>nd</sup> Division, CGPA : 5.362



Arunraj B

arunrajtpr19@gmail.com

[www.linkedin.com/in/](http://www.linkedin.com/in/arunraj-b-796b64218/)

arunraj-b-796b64218/

(+1) 515-337-4575

**Address**

321 S 5th St, Unit 213

Ames, IA

50010

## Awards and Recognition

- Best Oral Presentation Award, ICORTAC-2018
- DST SERB Junior and Senior Research Fellowship, 2017-2020.
- Grant received under DBT Star College Scheme for UG group project (2013). PI: Prof. Mary Vergheese