



Homi Bhabha National Institute

PhD students' Industry internship form

Name of the Student	Pamarthi Amesh
Enrolment Number	CHEM02201604005
Date of enrolment	01/08/2016
Name of CI/OCC	IGCAR
Discipline	Chemical science
Title of thesis	Development of organo-functionalized high capacity adsorbents for the recovery of uranium from aqueous solution and seawater
OGCE and all annual progress reports have been submitted	Yes
List of publications (if any)	Attached
Broad areas of research for internship	Adsorption, Material characterization, Sorbent development, Functionalized adsorbents, Gas adsorption, Metal/ pollutant adsorption, Water purification, Resource recovery, etc. (Refer CV for more details)
Brief CV of the student to be attached along with this form	

To be submitted through
respective Dean
Academic

Prof. C.V.S. BRAHMANANDA RAO
Dean, Academic - Chemical Sciences
Homi Bhabha National Institute - IGCAR
Kalpakkam, Tamilnadu -603 102.

List of publications

1. **Amesh P**, Suneesh AS, Selvan BR, Venkatesan KA. Amidic succinic acid moiety anchored silica gel for the extraction of UO_2^{2+} from aqueous medium and simulated sea water. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 2019 Oct 5;578:123585.
2. **Amesh P**, Suneesh AS, Venkatesan KA, Maheswari RU, Vijayalakshmi S. Preparation and ion exchange studies of cesium and strontium on sodium iron titanate. *Separation and Purification Technology*. 2020 May 1;238:116393.
3. **Amesh P**, Suneesh AS, Selvan BR, Venkatesan KA, Chandra M. Magnetic assisted separation of uranium (VI) from aqueous phase using diethylenetriamine modified high capacity iron oxide adsorbent. *Journal of Environmental Chemical Engineering*. 2020 Apr 1;8(2):103661.
4. **Amesh P**, Suneesh AS, Venkatesan KA, Chandra M, Ravindranath NA. High capacity amidic succinic acid functionalized mesoporous silica for the adsorption of uranium. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*. 2020 May 26:125053.
5. **Amesh P**, Venkatesan KA, Suneesh AS, Samanta N. Diethylenetriamine tethered mesoporous silica for the sequestration of uranium from aqueous solution and seawater. *Journal of Environmental Chemical Engineering*. 2020 Apr 30:103995.
6. **Amesh P**, Venkatesan KA, Suneesh AS, Maheswari U. Tuning the ion exchange behavior of cesium and strontium on sodium iron titanate. *Separation and Purification Technology*. 2021 Mar 26:118678.
7. **Amesh P**, Venkatesan KA, Suneesh AS, Gupta DK, Ravindran TR. Diethylenetriamine functionalized silica gel for adsorption of uranium from aqueous solution and seawater. *Journal of Radioanalytical and Nuclear Chemistry*. 2021 Jun 2:1-3.
8. Joshi RG, Gupta DK, **Amesh P**, Parida PK, Ravindran TR. Microgel-hydrogel composite photonic crystals to monitor and extract uranyl ions in aqueous solutions. *Microporous and Mesoporous Materials*. 2021 Apr 2:111075.
9. **Amesh P**, Venkatesan KA, Suneesh AS, Gupta DK, Ravindran TR. Efficient and selective adsorption of uranium by succinic acid modified iron oxide adsorbent. *Radiochimica Acta* (under review).
10. **Amesh P**, Venkatesan KA, Suneesh AS, Gupta DK, Ravindran TR. Adsorption of uranium by diethylenetriamine functionalized magnetic mesoporous silica. *Environmental Nanotechnology, Monitoring & Management*. 2021 Dec 1;16:100583.

11. **Amesh P**, Venkatesan KA, Suneesh AS, Gupta DK, Ravindran TR. Magnetite embedded succinic acid functionalized mesoporous silica for the magnetic assisted separation of uranium from aqueous solution. JCIS Open (Under review)



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Research Experience

Doctoral Studies at School of Chemistry Homi Bhabha National Institute

- Good experience in synthesizing functionalized porous materials for target specific pollutants/ metal ions from aqueous media.
- Designing and synthesizing surfactant assisted meso porous materials and their functionalized forms for resource recovery, water purification, adsorption studies, so on.
- Proficient in research data analysis and scientific report writing.

Education and Research Experience

- 2016-2021: **Ph.D.** in Chemistry (**Synthesis of functional adsorbent materials for metal ion recovery**)
- **Thesis entitled:** *Development of organo-functionalized high capacity adsorbents for recovery of uranium from aqueous solution and seawater.*
- 2012-2014: **M.Sc.** in Chemistry (**Inorganic Chemistry**) from A.U College of Arts & Science, Andhra University, Visakhapatnam.
- 2008-2011: **B.Sc. (Maths, Physics, and Chemistry)** from Andhra Loyola College, Acharya Nagarjuna University, Vijayawada, India.

Research Skills

Synthetic techniques expertized on

- Mesoporous and microporous materials
- Porous metal oxides synthesis
- Magnetic material synthesis
- Magnetic mesoporous hybrid composite materials
- Metal organic frame works
- Several organic functional groups
- Functionalization techniques
- Conventional aqueous synthesis
- Noble metal incorporated high surface area catalyst materials

- Inert condition synthesis (Glovebox)
- Post-synthetic modifications
- Organic-inorganic hybrid composite material synthesis etc.

Characterization Techniques (Instruments Handled)

- FT-IR (Bruker Tensor II)
- Raman (Renishaw)
- Powder X-ray diffraction (Philips 1011)
- UV-Vis spectrophotometer (Shimadzu and Avantes)
- Thermogravimetric analyzers (Metler Tolloedo, TGA/SDTA 851e)
- BET surface area analyzer (Sorpmatic equipment, Model -1990, Thermo electron corporation, USA)
- CHNS elemental analyzer (Euro EA Elemental Analyzer, EuroVector)

Characterization Techniques (Principle and data analysis)

- XPS spectral data fitting and its analysis
- XRD data analysis
- Inductively coupled plasma optical emission spectra (ICP-OES) data analysis
- Flame-AES
- FESEM-EDX, HRTEM data analyses
- NMR data analysis
- The software used for research data analyses:
 1. **Plotting and fitting software:** Origin, MATLAB, and Casa-XPS.
 2. **Computer skills:** C, C++, Microsoft Office, Chem-Draw, EndNote, Mendeley, SciFinder, etc.

Training of Lab Juniors

- During my Ph.D., trained one Ph.D. scholar for the synthesis of MOF & post synthetic techniques and two M.Sc. students in mastering the synthesis of functional porous materials, organic synthesis, separation of valuables from aqueous solution by adsorption.

List of Publications

1. "Amidic succinic acid moiety anchored silica gel for the extraction of U(VI) from aqueous medium and simulated sea water." **P. Amesh**, A. S. Suneesh, B. Robert Selvan and K. A. Venkatesan, Colloids and Surfaces A: Physicochemical and Engineering Aspects, 578 (2019) 123585.
2. "Magnetic assisted separation of uranium (VI) from aqueous phase using diethylenetriamine modified high capacity iron oxide adsorbent." **P. Amesh**, A. S. Suneesh, B. Robert Selvan, K. A. Venkatesan, and Manish Chandra, Journal of Environmental Chemical Engineering, 8 (2020) 103661.
3. "High capacity amidic succinic acid functionalized mesoporous silica for the adsorption of uranium." **P. Amesh**, A. S. Suneesh, K. A. Venkatesan, Manish Chandra, and Nair Afijith Ravindranath, Colloids and Surfaces A: Physicochemical and Engineering Aspects, 602 (2020) 125053.

4. "Diethylenetriamine tethered mesoporous silica for the sequestration of uranium from aqueous solution and seawater." **P. Amesh**, K. A. Venkatesan, A. S. Suneesh, and Nibedita Samanta. Journal of Environmental Chemical Engineering, 8 (2020) 103995.
5. "Diethylenetriamine functionalized silica gel for adsorption of uranium from aqueous solution and seawater". **P. Amesh**, K. A. Venkatesan, A. S. Suneesh, Deepak K. Gupta, and Ravindran T. R. Journal of Radioanalytical and Nuclear Chemistry. 329 (2021) 337 - 349.
6. "Efficient and selective adsorption of uranium by succinic acid modified iron oxide adsorbent". **P. Amesh**, K. A. Venkatesan, A. S. Suneesh, Manish Chandra, Deepak K. Gupta, and Ravindran T. R. Radiochimica Acta. (Under Review).
7. "Adsorption of uranium by diethylenetriamine functionalized magnetic mesoporous silica". **P. Amesh**, K. A. Venkatesan, A. S. Suneesh. Environmental Nanotechnology, Monitoring & Management. 16 (2021) 100583.
8. "Succinic acid functionalized magnetite embedded mesoporous silica for the magnetic separation of uranium from aqueous solution". **P. Amesh**, K. A. Venkatesan, A. S. Suneesh. JCIS open (Accepted)
9. "Preparation and ion exchange studies of cesium and strontium on sodium iron titanate". **P. Amesh**, Suneesh AS, Venkatesan KA, Maheswari RU, Vijayalakshmi S. Separation and Purification Technology. 238 (2020) 116393.
10. "Tuning the ion exchange behavior of cesium and strontium on sodium iron titanate". **P. Amesh**, Venkatesan KA, Suneesh AS, Maheswari U. Separation and Purification Technology. 267 (2021) 118678.
11. "Microgel-hydrogel composite photonic crystals to monitor and extract uranyl ions in aqueous solutions". Joshi RG, Gupta DK, **P. Amesh**, Parida PK, Ravindran TR. Microporous and Mesoporous Materials. 319 (2021) 111075.

Oral and Poster Presentations in Conferences

1. **Amesh P**, Suneesh AS, Robert Selvan B, Venkatesan KA. Succinic acid anchored silica gel adsorbent for the separation of uranium from aqueous phase. In Proceedings of the fourteenth biennial DAE-BRNS symposium on nuclear and radiochemistry: book of abstracts 2019.
2. **P. Amesh**, Magnetic solid-phase separation of uranium from aqueous solution using high capacity diethylenetriamine tethered magnetic adsorbents, Separation Techniques 2020, 10th World Conference on Separation Techniques & Formulation Reports.
3. Bapuji T, **Amesh P**, Subramanian GG, Suneesh AS, Venkatesan KA. Adsorption behavior of strontium and cesium in sodium iron titanates. In Proceedings of the fourteenth biennial DAE-BRNS symposium on nuclear and radiochemistry: book of abstracts 2019.
4. **Amesh P**, Suneesh AS, Robert Selvan B, Venkatesan KA. Evolving high capacity adsorbents for uranium extraction. DAE - BRNS sponsored Ninth Biennial Symposium on Emerging Trends in Separation Science and Technology: book of abstract 2021.

5. **Amesh P**, Suneesh AS, Robert Selvan B, Venkatesan KA. Effect of iron variation in sodium iron titanate on the ion exchange of cesium and strontium from aqueous solution. DAE - BRNS sponsored Ninth Biennial Symposium on Emerging Trends in Separation Science and Technology: book of abstract 2021.
6. **Amesh P**, Suneesh AS, Robert Selvan B, Venkatesan KA. Organo-functionalized mesoporous silica for sequestration of uranium from seawater. DAE - BRNS sponsored Ninth Biennial Symposium on Emerging Trends in Separation Science and Technology: book of abstract 2021

Fellowships/Awards

- Awarded as **Senior Research Fellow** on August 2018 at Homi Bhabha National Institute, Mumbai.
- Awarded as **Junior Research Fellow** on August 2016 at Homi Bhabha National Institute, Mumbai.
- Qualified in “Andhra Pradesh State Eligibility Test” (APSET- 2017).
- Qualified in “The Graduate Aptitude Test in Engineering” (GATE -2016).
- Secured a highly competitive state-level **70th** rank, in **AUCET**, for post-graduate studies conducted by Andhra University, Visakhapatnam, India, held on June 2012.
- Secured school 2nd rank during “class 10” public examination.

References

1. **Prof. K A Venkatesan** (Supervisor)
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I hereby declare that all the information furnished above is correct to the best of my belief and knowledge.

Sincerely

Pamarthi Amesh