

SUCHITHRA ASHOKA SAHADEVAN, Ph.D. (she/her)

Senior Scientist, Energy, Environmental and Chemical Engineering,
Urbauer 311, 1 Brookings Dr, Washington University in St Louis, MO 63130, USA

E-mail: sahadevan@wustl.edu, Phone: +1 314-760-4555, [LinkedIn](#), [Google scholar](#)

RESEARCH INTERESTS: Inorganic and physical chemistry, Coordination polymers for sustainable energy applications, Hydrogen purification, Lithium-ion battery recycling, Energy storage, Electrochemistry and Inorganic solid-state chemistry.

EDUCATION

2015-2019 **Université d'Angers, France (co-joint with the University of Cagliari, Italy)**
Ph.D. in Chemical Sciences and Technologies (Inorganic chemistry)

2010-2015 **Indian Institute of Science Education and Research (IISER) Kolkata**
Integrated Bachelors and Master of Science in Chemical Sciences

RESEARCH EXPERIENCE

May 2022- Present Postdoctoral Research Associate, Energy Environmental and Chemical Engineering,
Washington University in St. Louis, USA

PI: Prof. Vijay Ramani

Research interests: Hydrogen purification using an electrochemical hydrogen pump (EHP), Electrochemical energy storage, and Lithium-ion battery recycling.

- **Hydrogen Purification and Electrocatalysis:** Optimized hydrogen purification from reformat using an EHP, enhancing system performance and efficiency. (Funded by a \$2M U.S. Department of Energy grant).
- **Electrocatalyst Development:** Led the development of Pt/RTO electrocatalysts, focusing on optimizing hydrogen purification through mechanistic insights.
- **Energy Storage and Catalysis:** Developed pyrochlore and platinum-based electrocatalysts for enhanced ORR/OER in metal-oxygen batteries, improving efficiency and stability. Applied operando techniques to gain mechanistic insights and optimize catalytic performance under real conditions.

Jan 2021-Jan 2022 Postdoctoral Fellow, Department of Applied Physical Chemistry,
KTH Royal Institute of Technology, Sweden

PI: Dr. James Gardner

Research interests: Recovery of critical metals, Hydrometallurgy, Sustainability

- **Metal Recovery:** Innovated a sustainable method for the selective recovery of metals from battery waste and obtained a 98 % copper recovery rate.
- **Polymer Synthesis:** Synthesized sulfur-organic polymers from low-cost industrial waste and developed value-added materials.
- **Battery Discharging:** Studied temperature optimization and internal chemical changes on cathode material during the solution discharge step in LIB recycling (co-guide of master thesis).

Feb 2019- Nov 2019 Researcher, Department of Chemical Sciences and Technologies
The University of Cagliari, Italy

PI: Prof. Maria Laura Mercuri

Research interests: Coordination polymers, Functional molecular materials

Sept 2015- Feb 2019

• Synthesis of anilate-based luminescent MOFs
Graduate Researcher, Department of Chemical Sciences and Technologies
Université d'Angers, France and University of Cagliari, Italy

Advisors: Dr. Narcis Avarvari and Prof. Maria Luara Mercuri

Dissertation title: Anilate-based molecular building blocks for metal-organic frameworks (MOFs) and molecular conductors.

- **Inorganic and material synthesis:** Synthesized anilate-based MOFs and coordination polymers for energy applications, sensing, and storage.
- **Solid state chemistry:** Synthesized hybrid pi-d multifunctional materials and investigated their crystal structure and properties at a fundamental level.

PEER-REVIEWED PUBLICATIONS (12 first-authored, 1 co-corresponding author, 27 total; 1 provisional patent filed) [Google Scholar](#)

1. **S. Ashoka Sahadevan**, S. Shrivastava, V. Ramani Unlocking Geological Hydrogen: A Pressure-Driven Electrochemical Recovery [Energy Fuels](#), **2025**, 39, 21039–21049.
2. K. Sharma; **S. Ashoka Sahadevan**; V. Ramani Pulsed Oxidation-Driven Catalyst Regeneration Enabling Durable CO-Tolerant Low-Temperature Electrochemical Hydrogen Pumps [ACS Sustainable Chem. Eng.](#) **2025** 13, 15875–15886.
3. E. Asadipour, K. Sharma, **S. Ashoka Sahadevan**; V. Ramani Recent advances in membranes and ionomers for high and low-temperature electrochemical hydrogen pumps [Indian Chem. Eng.](#), **2025**, 67, 521–546.
4. E. Asadipour; **S. Ashoka Sahadevan**; V. Ramani Recent Polymer-blended and reinforced anion-exchange membranes for methanesulfonic acid-based titanium–cerium redox flow batteries [J. Mem. Sci.](#) **2025**, 785, 123696.
5. **S. Ashoka Sahadevan**, M. Shahid, S. Sankarasubramanian, V. Ramani; Lithium-ion battery recycling: Ternary deep eutectic solvents for efficient electrochemical recovery of metals, [J. Mater Chem A](#), **2025**, 13, 12625–12638
6. M. Shahid, **S. Ashoka Sahadevan**, V. Ramani and S. Sankarasubramanian; Recommended practices for the electrochemical recovery of cobalt from lithium cobalt oxide: a case study of the choline chloride: glycol deep eutectic solvent, [ChemSusChem](#), **2024** *In press*.
7. Y. Ma, M. Akbarkermani, M. Svärd, X. Xiao, **S. Ashoka Sahadevan**, J. Gardner, R. T. Olsson, K. Forsberg Phase diagrams of CoSO₄-H₂O and CoSO₄-H₂SO₄-H₂O systems for CoSO₄ recovery by cooling and eutectic freeze crystallization, [Hydrometallurgy](#), **2024**, 224, 106332.
8. **S. Ashoka Sahadevan**, X. Xiong, Y. Maa, K. Forsberg, R. T. Olsson, J. Gardner Sulfur-oleyamine copolymer synthesized via inverse vulcanization for the selective recovery of copper from lithium-ion battery e-waste [Mater. Chem. Front.](#) **2023**, 7, 1374-1384.
9. M. Oggianu, F. Manna, **S. Ashoka Sahadevan**, A. Abhervé, and M. L. Mercuri Metal-organic framework vs. coordination polymer—influence of the lanthanide on the nature of the heteroleptic anilate/terephthalate 3D network. [Crystals](#) **2022**, 12, 763.
10. N. Monni, M. Sanna Angotzi, M. Oggianu, **S. Ashoka Sahadevan*** and M. L. Mercuri Redox-active benzoquinones as challenging “non-innocent” linkers to construct 2d frameworks and nanostructures with tunable physical properties [J. Mater Chem. C](#), **2022**, 10, 1548-1572 (Cover Page).

11. Y. Maa, M. Svård, X. Xiao, **S. Ashoka Sahadevan**, J. Gardner, R. T. Olsson, K. Forsberg Eutectic freezecrystallization for recovery of NiSO_4 and CoSO_4 hydrates from sulfate solutions, *Sep. Purif. Technol.*, **2022**, 286, 120308.
12. **S. Ashoka Sahadevan**, F. Manna, A. Abhervé, M. Oggianu, N. Monni, V. Mameli, D. Marongiu, F. Quochi, F. Gendron, B. L. Guennic, N. Avarvari, and M. L. Mercuri. Combined experimental/theoretical study on the luminescent properties of homoleptic/heteroleptic Erbium (III) anilate-based 2d coordination polymers *Inorg. Chem.* **2021**, 60, 17765–17774.
13. X. Xiao, B. W. Hoogendoorn, Y. Ma, **S. Ashoka Sahadevan**, J. M. Gardner, K. Forsberg and R. T. Olsson Ultrasound-assisted extraction of metals from lithium-ion batteries using natural organic acids, *Green Chem.*, **2021**, 23, 8519.
14. N. Monni, M. Oggianu, **S. Ashoka Sahadevan**, M. L. Mercuri, Redox activity as a powerful strategy to tune magnetic and/or conducting properties in benzoquinone-based metal-organic frameworks *Magnetochemistry*, **2021**, 7, 109.
15. M. Oggianu, V. Mameli, N. Monni, **S. Ashoka Sahadevan**, M. S. Angotzi, C. Cannas, M. L. Mercuri Nanoscaled metal-organic frameworks (Nanomofs): challenges towards biomedical applications, *J. Nanosci. Nanotechnol.*, **2021**, 21, 2922-2929.
16. M. Oggianu, C. Figus, **S. Ashoka-Sahadevan**, N. Monni, D. Marongiu, M. Saba, A. Mura, G. Bongiovanni, C. Caltagirone, V. Lippolis, C. Cannas, E. Cadoni, M. L. Mercuri and F. Quochi Silicon-based fluorescent platforms for copper(II) detection in water, *RSC Adv.*, **2021**, 11, 15557-15564.
17. M. Oggianu, N. Monni, V. Mameli, C. Cannas, **S. Ashoka Sahadevan**, M. L. Mercuri Designing magnetic nanomofs for biomedicine: current trends and applications *Magnetochemistry*, **2020**, 6, 39.
18. **S. Ashoka Sahadevan**, A. Abhervé, N. Monni, P. Auban-Senzier, H. Cui, R. Kato, M. L. Mercuri, N. Avarvari Radical cation salts of tetramethyltetrathiafulvalene (tm-ttf) and tetramethyltetraselenafulvalene (TM-TSF) with chlorocyanilate-based anions, *Cryst. Growth Des.*, **2020**, 20, 6777-6786. Cover art
19. **S. Ashoka Sahadevan**, N. Monni, M. Oggianu, A. Abhervé, D. Marongiu, M. Saba, A. Mura, G. Bongiovanni, V. Mameli, C. Cannas, N. Avarvari, F. Quochi and M. L. Mercuri. Heteroleptic NIR-emitting Yb^{III} /anilate-based neutral coordination polymer nanosheets for solvent sensing, *ACS Appl. Nano Mater.*, **2020**, 3, 94-104.
20. **S. Ashoka Sahadevan**, A. Abhervé, N. Monni, P. Auban-Senzier, J. Cano, F. Lloret, M. Julve, H. Cui, R. Kato, M. L. Mercuri, N. Avarvari. Magnetic molecular conductors based on bis(ethylenedithio)tetrathiafulvalene (bedt-ttf) and the tris(chlorocyanilato)ferrate(III) complex, *Inorg. Chem.*, **2019**, 58, 15359-15370.
21. **S. Ashoka Sahadevan**, N. Monni, A. Abhervé, G. Consquer, M. Oggianu, G. Ennas, M. Yamashita, N. Avarvari, M. L. Mercuri, Dysprosium chlorocyanilate-based 2D-layered coordination polymers, *Inorg. Chem.*, **2019**, 58, 13988–13998.
22. N. Monni, V. Mameli, **S. Ashoka Sahadevan**, S. Gai, C. Cannas, M. Laura Mercuri, Raman spectroscopy as a probe for determining the zinc contents in Zn-substituted cobalt ferrites, *J. Nanosci. Nanotechnol.*, **2019**, 19, 5043-5047
23. **S. Ashoka Sahadevan**, A. Abhervé, N. Monni, C. Sáenz de Pipaón, J. R. Galán-Mascarós, J. C. Waerenborgh, B. J. C. Vieira, P. Auban-Senzier, S. Pillet, E.-E. Bendeif, P. Alemany, E. Canadell, M. L. Mercuri and N. Avarvari. Conducting anilate-based mixed-valence Fe(II)Fe(III) coordination polymer: small-polaron hopping model in oxalate-type Fe(II)Fe(III) 2D networks, *J. Am. Chem. Soc.*, **2018**, 140, 12611–12621.
24. **S. Ashoka Sahadevan**, N. Monni, A. Abhervé, D. Marongiu, V. Sarritzu, N. Sestu, M. Saba, A. Mura, G. Bongiovanni, C. Cannas, F. Quochi, N. Avarvari and M. L. Mercuri, Nanosheets of 2D neutral coordination polymers based on NIR-emitting lanthanides and chlorocyanilate ligand, *Chem. Mater.*, **2018**, 30, 6575–6586.
25. **S. Ashoka Sahadevan**, E. Cadoni, N. Monni, C. Sáenz de Pipaón, J.-R. Galan Mascaros, A. Abhervé, N. Avarvari, L. Marchiò, M. L. Mercuri, Structural diversity in a new series of halogenated quinolylsalicylaldimides-based Fe^{III} complexes showing solid-state halogen-bonding/halogen...halogen interactions, *Cryst. Growth Des.* **2018**, 18,

4187–4199.

26. **S. Ashoka Sahadevan**, N. Monni, A. Abhervé, P. Auban-Senzier, E. Canadell, M. L. Mercuri, N. Avarvari, Synthesis and physical properties of purely organic BEDT-TTF-based conductors containing hetero/homosubstituted Cl/CN⁻ anilate derivatives, *Inorg. Chem.* **2017**, 56, 12564–12571.
27. M. L. Mercuri, F. Congiu, G. Concas, **S. Ashoka Sahadevan**, Recent advances on anilato-based molecular materials with magnetic and/or conducting properties, *Magnetochemistry*, **2017**, 3, 17.

PATENTS

Provisional Patent Filed: Reference #: DF-016109

Selective, sustainable, and continuous lithium-ion battery material recycling at scale using chemical stripping followed by electroplating enabled by high-voltage deep eutectic solvents (HV-DES), 2024

Inventors: **S. Ashoka Sahadevan**, V. Ramani, S. Mohamed, S. Sankarasubramanian

SELECTED CONFERENCES AND PRESENTATIONS

1. 244th ECS Meeting, San Francisco, 2024
Lithium-ion battery recycling: Ternary deep eutectic solvents enable efficient and selective electrochemical recovery of critical component metals.
2. 243rd ECS Meeting, Boston, USA, 2023
Pyrochlore electrocatalyst for cathodes in potassium-oxygen batteries
3. ISCOM 2019, International Symposium on Crystalline Organic Metals, Superconductors and Magnets, Tomar, Portugal
Magnetic molecular conductors based on bis(ethylenedithio)tetrathiafulvalene (bedt-ttf) and the tris(chlorocyanilato)ferrate(III) complex
4. ICCC2018 International Conference on Coordination Chemistry, Sendai, Japan
Anilate-based molecular building- blocks for chiral/achiral molecular conductors and porous materials.
5. EsmolNa2018 European School on Molecular Nanoscience and WD2M Workshop on 2D materials, Tenerife, Spain
Nanosheets of 2D neutral coordination polymers based on NIR-emitting lanthanides and chlorocyananilate ligand.
6. SUPRAMOL-2017, 13th Italian Conference on Supramolecular Chemistry, Santa Margherita di Pula, Cagliari
Synthesis and physical properties of supramolecular networks based on chlorocyananilate ligand.
7. SCF-BPL-2017 (Journées Scientifiques 2017), Le Mans, France
Hybrid molecular materials based on bedt-ttf and anilate derivatives
8. GdR-MCM2; Molecular Magnetism and Switching, Dourdan, France
A 2D mixed-valence honeycomb layered network based on the chlorocyananilate green luminophore

SERVICES AND OUTREACH

2022- Present	Reviewer in (20+ publications reviews) (Angewandte Chemie, Polymers, Sustainability, Crystals, Biosensors, Molecules, Materials)
2022- Present	Coordinated lab tours at WashU for Burroughs High School students to encourage careers in STEM fields.
2018	Co-organizer of an international workshop on hybrid molecular materials (HybMolMat 2018), funded by Bando Cassini (French embassy in Italy) at the University of Cagliari, Italy.
2015	Member of the student organizing committee of JSPS-DST Asian academic seminar and school conducted by IACS and IISER Kolkata, India.

GRANTS AND FUNDING (co-written with PI)

2024	Electrochemical H ₂ Pressurization, Purification and Power Generation (EHP ³)
2023	Selective, sustainable, and continuous lithium-ion battery material recycling using HV-DES (DE-FOA-0002680).
2023	HITMAN Electrolytes for High-Power, Fast-Charging Potassium-Air Batteries (DE-FOA-0002760).
2023	Cu-Nanofluid-Enhanced Thermally Regenerated Cu-NH ₃ RFBs for Low-T Waste Heat to Electricity Conversion (DE-FOA-0002804).

PROJECT MANAGEMENT

2022-Present	Led reporting and presentations for the DOE-funded EHP project (FE0032178).
---------------------	---

SELECTED MENTORING

2024	Marianna Garcia, Undergraduate student (Summer intern), Washington University in St. Louis (Publication under communication)
2022-Present	Erfan Asadipour, PhD student, Washington University in St. Louis (Publication under communication)
2022	Hari Srinivasan, Undergraduate student, Washington University in St. Louis
2021	Berfu Karli, Master's student (Co-advisor), KTH Royal Institute of Technology, Sweden
2017-2019	Mariangela Oggianu, PhD student, University of Cagliari, Italy (Published 4 papers together)
2016-2019	Noemi Monni, Master student, University of Cagliari, Italy (Published 5 papers together)

TEACHING

2021	Course Assistant, KA103X Degree Project in Engineering Chemistry, KTH Royal Institute of Technology, Sweden
2018	Teaching Assistant, CHIM/03 General and Inorganic Chemistry (50+ undergraduate students), University of Cagliari, Italy
2017	Teaching Assistant, Natural Science-L32 Laboratory, Faculty of Biology and Pharmacy (50+ undergraduate students), University of Cagliari, Italy

AWARDS

2021	Postdoctoral scholarship, KTH Royal Institute of Technology, Sweden
2019	Best PhD Award with <i>Excellent cum laude</i> (graduated with honors), University of Cagliari, Italy
2019	CCDC crystallographic grant award, CIFiesta. AIC International Crystallography School Naples, Italy.
2018	National winner of the Bando Cassini Call for promoting the scientific exchange workshop.
2018	Exchange research grant, COST Action MolSpin (European Cooperation in Science and Technology), University of Valencia, Spain (3 months)
2010- 2015	INSPIRE scholarship, Department of Science and Technology, Govt. of India.

REFERENCES

Prof. Vijay Ramani (Postdoc mentor) Vice Provost for Graduate Education and International Affairs Roma B. & Raymond H. Wittcoff, Distinguished University Professor Professor, Washington University in St. Louis 1 brooking drive, Brauer Hall St. Louis, MO- 63130 ramani@wustl.edu Tel: +1 3149353000	Dr. Narcis Avarvari (PhD advisor) Directeur de Recherches CNRS University of Angers, France Laboratoire Moltech Anjou UMR 6200 CNRS- University of Angers UFR Sciences, Bât. K 2 bd. Lavoisier, 49045 ANGERS, France narcis.avarvari@univ-angers.fr Tel: +33 241735084
Dr. James Gardner (Postdoc mentor) Associate Professor, KTH Royal Institute of Technology Head of Applied Physical Chemistry Department of Chemistry Teknikringen 30 SE-100 44 Stockholm, Sweden jgardner@kth.se Tel: +46 87908167	