CURRICULUM VITAE

Aishvarya Venkataseetharaman, B.Tech, M.Tech, Ph.D.

Principal Scientist,
Hydro & Electrometallurgy department,
CSIR-Institute of Minerals and Materials Technology,
Bhubaneswar, Odisha- 751013.
Ph: 0674-2379168

aishvarya@immt.res.in;
v.aishvarya@gmail.com

ACADEMIC QUALIFICATION

Ph.D. (Engineering)	July 2020	*Academy of Scientific and Innovative Research (AcSIR), New Delhi.*
M.Tech (Material Resource Engineering)	2011	*Academy of Scientific and Innovative Research (AcSIR), New Delhi.*
B.Tech (Biotechnology)	2009	*SASTRA University, Thanjavur, Tamil Nadu.*

PROFESSIONAL EXPERIENCE

2020-present	Principal Scientist	*CSIR-Institute of Minerals & Materials Technology, Bhubaneswar*
2016-2020	Senior Scientist	*CSIR-Institute of Minerals & Materials Technology, Bhubaneswar*
2011-16	Scientist	*CSIR-Institute of Minerals & Materials Technology, Bhubaneswar*
2009-11	CSIR Quick Hire Fellow Trainee Scientist	*CSIR-Institute of Minerals & Materials Technology, Bhubaneswar*

RESEARCH DOMAIN

Dr Aishvarya Venkataseetharaman (referred to as V. Aishvarya) has over 12 years of work experience in the field of hydrometallurgy and bio-hydrometallurgy, working on the recovery of non-ferrous critical metals such as Co, Li, Ni, Mn, Zn, Cu, W, Pb, Ag etc through processing of low-grade ores, secondary raw materials such as industrial wastes, slags, scrap, spent

catalysts, spent battery, mine tailings and overburdens. Her research interest lies in process flowsheet development and process engineering for the recovery of non-ferrous metals with special focus on leaching (chemical, microbial, electro-chemical & pressure leaching), purification (ion exchange, precipitation, cementation) and process integration methods. Some of her recent project works are,

Ongoing Projects:

- Recovery of Zinc, lead and silver from Mill tailings of Hindustan Zinc Ltd, ***funded by HZL Udaipur*** **(Project leader),** 2024-25;
- Downstream processing of high silica containing bauxite liquor for product-based utilization, ***funded by NALCO*** **(Project leader)**, 2023-25;
- Recovery of Copper from low-grade copper ores: oxide and sulphide ores, ***funded by CSIR*** **(Co- Project leader & WP2 leader),** 2024-27;
- Recovery of Co & Ni from chromite overburden, ***funded by CSIR*** **(Co- Project leader & WP2 leader),** 2024-27;
- Technology on recovery of metals from polymetallic nodules, ***funded by Ministry of Earth sciences,*** Govt of India (as **Activity in-charge**), 2021-2024;
- Integrated bio and hydrometallurgical techniques for the recovery of metals from spent battery waste and recycling wastewater, ***funded by IGSTC 2+2***, **(WP6 leader),** 2024-27;
- Studies on CO_2 sequestration by Mineral carbonation process **(Co- Project leader),** ***funded by CSIR***, 2023-26;
- Algae-based flue gas CO_2 sequestration with co-production of high-value biochemicals **(Co- Project leader),** ***funded by CSIR***, 2023-26;
- Recovery of copper from copper oxide ore **(Co- Project leader),** ***funded by Onshore construction company pvt Ltd***.,2023-24;

Completed projects:

- Recovery of Mn as EMD from low grade ores and secondaries for energy application, *funded by CSIR* (**Project leader**), 2020-2023;
- Technology transfer of cobalt manufacture, *funded by Mishra Dhatu Nigam Limited (MIDHANI),* Hyderabad (as **Co-PI**), 2019-2021, extended to 2022;
- Cobalt technology from impure cobalt hydroxide: Process flowsheet development, *funded by MIDHANI,* Hyderabad (as **Co-PI**), 2020-21; extended to 2022;
- Recovery of Electrolytic manganese dioxide (EMD) from manganese ore, *funded by Manganese Ore India Ltd (MOIL)*. (**as Co-PI**, 2019-2021)
- Recovery of Lithium from spent lithium ion battery (LIB), funded by CSIR **(as Co-PI**, 2018-2020)
- Recovery of alumina from NALCO flyash, funded by NALCO (as member, 2018-2020)

- Extraction of Tungsten values from Hutti gold mine tailings concentrate and Scrap: process flowsheet development, bench scale studies and pilot scale testing, funded by DMRL (as member, 2017-19)
- Evaluation of design parameters for dewatering of manganese nodules, funded by NIOT (as member, 2016-17)
- Process flowsheet testing of low grade manganese ore, funded by Tata Steel Ltd. (as member, 2016-17)
- Development of green process for CO_2 sequestration using High Rate Algal Pond, funded by DST, Govt of India (**as Co-PI**, 2013-16)
- Feasibility studies to recover Mn metal from low grade ore, funded by Tata Steel Ltd. (as member, 2016-17)

PATENTS

1. An efficient self-conveying plasma treatment device for disinfecting flowable objects (IN 202411009987)

PUBLICATIONS

1. Anoxic Manganese Bioleaching – Investigation of Scale-up Parameters in a Stirred Bioreactor, T. Das, **V. Aishvarya**, N. Pradhan, K. Sanjay, GeomicrobiologyJournal, 2024, https://doi.org/10.1080/01490451.2024.2399188
2. Rethinking oxide bioleaching with Metal reducing bacteria, **V. Aishvarya** and T. Das, Proceedings of Processing of critical Minerals-Critical Minerals'24, MEI Conferences, November 2024.
3. Selective Recovery of Copper from the Mixed Metals Leach Liquor of E-Waste Materials by Ion-Exchange: Batch and Column Study, 2023, Emmanuel A Ajiboye, **V. Aishvarya**, Jochen Petersen. Minerals, 13 (10), 1285. https://doi.org/10.3390/min13101285
4. Towards Solving the Complexity Associated with Continuous Countercurrent Decantation (CCD) System in Solid–Liquid Separation Processes, 2023, Anil Kumar Tripathy, SS Behera, B Marandi, P Sahu, AR Sheik, **V Aishvarya**, Indra Narayan Bhattacharya, Kali Sanjay, Journal of The Institution of Engineers (India): Series D, https://doi.org/10.1007/s40033-023-00533-3
5. An integrated ammonia and acid leaching based process for recovery of metal values from Indian Ocean manganese nodules, **V.Aishvarya**, B.Dash, B.L.Tudu, M.G.Sujana and K.Sanjay. IEEE, OCEANS 2022 - Chennai, 2022, pp. 1-4, https://doi: 10.1109/OCEANSChennai45887.2022.9775223
6. Role of Glycerol Oxidation Pathways in the Reductive Acid Leaching Kinetics of Manganese Nodules Using Glycerol, 2021, **V.Aishvarya**, G. Mishra, M.K. Ghosh, G.K. Das, ACS Omega, 6 (23), 14903-14910.
7. Production of Electrolytic manganese dioxide (EMD) for Li ion battery applications from secondaries, **V. Aishvarya**, B. Marandi, A.R. Sheik, I.N. Bhattacharya, K. Sanjay.

Proceedings XIV International Mineral Processing and Recycling Conference, 2021, ISBN 978-86-6305-113-3, Page 334-338.

8. Preparation of metallurgical grade alumina from coal flyash, 2020, A. Tripathy, C.K. Sarangi, A.R.Sheik, **V.Aishvarya,** B. Marandi, P.Sahu, I.N.Bhattacharya and K.Sanjay, 38th International ICSOBA, Travaux 49, 349-356.
9. Selective enhancement of Mn bioleaching from ferromanganese ores in presence of electron shuttles using dissimilatory Mn reducing consortia, 2019, **V.Aishvarya**, S.Barman, N.Pradhan, M.K.Ghosh. Hydrometallurgy, 186, 269-274.
10. Sodium fluoride assisted acid leaching of coal fly ash for the extraction of alumina, 2018, A.K.Tripathy, B.Behera, **V.Aishvarya**, A.R.Sheik, B.Dash, C.K.Sarangi, B.C.Tripathy, K.Sanjay, I.N.Bhattacharya. Minerals Engineering, 131, 140-145.
11. Enhanced anoxic bioleaching of Mn in presence of electron shuttles by anaerobic MRC, 2017, **V.Aishvarya**, N.Pradhan and M.K.Ghosh. Proceedings of International seminar on Mineral Processing Technology (MPT 2017).
12. Bioleaching of Indian Ocean nodules with in situ iron precipitation by anaerobic Mn reducing consortia,2016, **V. Aishvarya**, G.Mishra, N Pradhan, MK Ghosh. Hydrometallurgy, 166, 130-135.
13. Biological sequestration and retention of cadmium as CdS nanoparticles by the microalga Scenedesmus-24,2015, J Jena, N Pradhan, **V Aishvarya**, RR Nayak, BP Dash, LB Sukla, Journal of Applied Phycology, 27(6), 2251-2260.
14. Microalgae: Cultivation and Application, **V.Aishvarya**, J Jena, N Pradhan, PK Panda, LB Sukla. (Book chapter) Environmental Microbial Biotechnology, 289-311. 2015. Springer publications.
15. Reductive acid leaching of polymetallic manganese nodule with polyol: Preliminary study, 2013, **V Aishvarya**, G Mishra, MK Ghosh, T Subbaiah, XIII International seminar on Mineral Processing Technology (MPT 2013) vol 3, 825-829.
16. Hydroxyapatite-coated magnesium based biodegradable alloy: Cold spray deposition and Simulated body fluid studies, 2013, A.C.W. Noorakma, H. Zuhailawati, **V.Aishvarya** and B.K. Dhindaw. Journal of Materials Engineering and Performance, 22(10), 2997-3004.
17. Enhanced inorganic carbon uptake by Chlorella sp. IMMTCC-2 under autotrophic conditions for lipid production and CO2 sequestration, 2012, **V. Aishvarya**, N. Pradhan, R.R. Nayak, L.B. Sukla& B.K. Mishra. Journal of Applied Phycology, 24(6), 1455-1463.
18. A Novel Approach for Oral Delivery of Insulin via *Desmodium gangeticum* Aqueous Root Extract, 2010, G A Kurian, **A V Seetharaman**, NR Subramanian, J Paddikkala. Journal of Young Pharmacists, Vol 2, 156-161.

AWARDS

- First prize for technical paper presentation for the work "Beneficiation strategies to utilize the PLK rock for industrial applications" authored by Satyasish Rout, C. Eswariah, S.D.Brma and V. Aishvarya at *39th National convention of Chemical Engineers and National Seminar on R&D activities in Mineral, Chemical, Metallurgical industries for today's society*, by The Institution of Engineers (India), Nov 2024.
- One lakh cash prize (INR 1,00,000) in the 'Grand fly ash utilization challenge' contest conducted by NTPC (team award) during 2018-19
- MISRA AWARD by Indian Institute of Mineral Engineers (IIME) for best paper on Hydro-bio-electrometallurgy (2017)
- Best Poster award at Bangalore INDIA BIO (2011)
- Graduate Aptitude Test in Engineering - GATE (2010)
- Top 1% (Dean's list) of university graduates (for 2nd, 3rd & 4th year of B.Tech)