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Objective: To gain post-doctoral experience by working in a stimulating and conducive environment in order to become a leading researcher in Materials Science

Educational Profile

Qualification	University/School	Major/Minor Stream	Year of Passing	CGPA
Doctor of Philosophy	Indian Institute of Technology Madras	Metallurgical & Materials Engineering	2017	9.75
B.Tech & M.Tech (Dual Degree)	Indian Institute of Technology Madras	Metallurgical & Materials Engineering <i>Minor: Chemistry</i>	2010	8.9
12 th	Anand Vihar School, Bhopal	Physics, Chemistry, Maths	2004	8.2

Post doctoral experience

Project: To study the impact of deformation on diffusion behaviour of coarse and fine grained Nickel. Radiotracer method is used to determine diffusivity of Ni in pure Ni deformed to different strain levels. Grain size of Ni is also being varied to bring out the influence of grain size and hence delineate the dominance of bulk and grain boundary diffusion.

Duration: 16.04.2018 – Present

Mentor: PD Dr. Sergiy Divinski, Institute of Materials Physics, University of Muenster, Germany

Projects/Internships

Project 1 (Doctoral thesis work): The aim of the present research work is to study the **thermal stability** and **diffusion behaviour of high entropy alloys (HEAs)**. The research presents pioneering work on measurement of diffusion in CoCrFeNi and CoCrFeMnNi alloys using radiotracer analysis. Interdiffusion coefficients have also been determined to compare

atomic transport in presence and absence of chemical driving force. Thermal stability of these FCC HEAs has also been examined.

Duration: August 2012 – December 2017

Project Guide: Prof. B.S.Murty, Dept of Metallurgical and Materials Engineering, IIT Madras

Skills developed: Synthesis techniques - Arc melting, mechanical alloying and spark plasma sintering. Characterization tools – X-ray diffraction, differential thermal analysis and scanning electron microscopy. Diffusion measurements – Tracer and interdiffusion techniques.

Project 2 (M.Tech Thesis): The project aimed at studying the magnetoelectric properties of **Nano Multiferroic Composites of Copper modified Nickel Zinc Ferrites and Barium Titanate**, and comparing them with corresponding microcrystalline materials. The work involves reduction of crystallite size of ferrites and barium titanate separately by **high energy milling**, subsequently mixing them to form Nanocomposites and then studying the properties such as magnetoelectric response, magnetization etc.

Duration: August 2009 – May 2010

Project Guide: Prof. B.S.Murty, Dept of Metallurgical and Materials Engineering, IIT Madras

Work experience (before PhD)

Company: ESSAR Steel, Hazira, Surat

Department: Research & Development

Duration: July 2010 – Present

Projects: Some of the important works taken up are as mentioned below:

- ✓ Increasing productivity of Batch Annealing Furnace by reducing annealing cycle time by 6 hours
- ✓ Development of Hot Rolled Dual Phase Steel and HSLA steels

Journal publications

- ✓ **Vaidya M.**, Pradeep K.G., Murty B.S., Wilde G., Divinski S.V. (2018): Bulk tracer diffusion in CoCrFeNi and CoCrFeMnNi high entropy alloys. *Acta Materialia*, 146, 211-224
- ✓ **Vaidya M.**, Pradeep K.G., Murty B.S., Wilde G., Divinski, S.V. (2017): Radioactive isotopes reveal a non sluggish kinetics of grain boundary diffusion in high entropy alloys. *Scientific Reports*, 7, 12293.
- ✓ **Vaidya M.**, Prasad A., Parakh A., Murty B.S. (2017): Influence of sequence of elemental addition on phase evolution in nanocrystalline AlCoCrFeNi: Novel approach to alloy synthesis using mechanical alloying. *Materials & Design*, 126, 37-46.
- ✓ **Vaidya M.**, Trubel S., Murty B.S., Wilde G., Divinski S.V. (2016): Ni tracer diffusion in CoCrFeNi and CoCrFeMnNi high entropy alloys. *Journal of Alloys and Compounds*, 688, 994-1001.

- ✓ **Vaidya M.**, Armugam S., Kashyap S., Murty B.S. (2015): Amorphization in equiatomic high entropy alloys. *Journal of Non-Crystalline Solids*, 413, 8-14.

Conference presentations

- ✓ **Vaidya M.**, Trubel S., Murty B.S., Wilde G. and Divinski S.V., "Diffusion in equiatomic FCC high entropy alloys". TMS Annual meeting, 14th – 18th Feb 2016, Nashville (T.N), USA (Oral Presentation).
- ✓ **Vaidya M.**, Prasad A., Parakh A., Murty B.S, Phase evolution in nanocrystalline AlCoCrFeNi by varying sequence of elemental additions: Novel approach to alloy synthesis using mechanical alloying, International Conference on Metal and Materials Research (ICMR), 20th – 22nd June 2016, Bangalore, India(Poster Presentation).
- ✓ **Vaidya M.**, Trubel S., Murty B.S, Wilde G. and Divinski S.V, Tracer diffusion studies in equiatomic FCC high entropy alloys, International conference on Diffusion in Solids and Liquids (DSL), 22nd – 26th June 2015, Munich, Germany (Oral Presentation).
- ✓ **Vaidya M.**, Trubel S., Murty B.S, Wilde G. and Divinski S.V, Phase composition, microstructure and Ni tracer diffusion in FCC FeCrCoNi-based high entropy alloys, Annual Spring meeting of DPG, 15th – 20th March 2015, Berlin, Germany (Oral Presentation).

Academic Achievements

- ✓ **Outstanding Reviewer Award** for SCI indexed journal "Journal of Alloys and Compounds" (Impact factor – 3.133)
- ✓ Received **best publication award** from Dept. of MME, IIT Madras for the paper titled "Ni tracer diffusion in CoCrFeNi and CoCrFeMnNi high entropy alloys" published in Journal of alloys and compounds (2016)
- ✓ Received **best paper award** at In-house symposium – 2017, organized by Dept. of MME, IIT Madras
- ✓ Received **DAAD sandwich scholarship** to pursue part of my research work at University of Muenster, Muenster, Germany (June 2014 – Sep 2015)
- ✓ Received **Institute Silver Medal** for securing **best academic record** in Metallurgical & Materials Engineering (Dual Degree) in period 2005-2010.
- ✓ Received **DAAD scholarship, WISE-2009**, to do an internship in Germany

Extra Curricular Activities

- ✓ Won third prize in Materials Science quiz organized at International Symposium for Research Scholars (ISRS-2016) during 21 – 23rd Dec 2016
- ✓ Organizing committee member for International Symposium for Research Scholars (ISRS-2012) and conference on Advances in Naval Materials -2013
- ✓ Coordinated Quiz Contest which was a part of International Conference on Advances in Manufacturing Technology (ICAMT) - 2009.