

Somaiya Vidyavihar University

Name: Luckman Muhmood			E-mail:luckman@somaiya.edu	
Contact No: 9969757811				
Department/Section: Mechanical Engineering				
College: K J Somaiya College of Engineering				
DOJ Somaiya: 01-09-2014	Career Experience: 18 Yrs	Industry Experience: 1.5 Yr	Teaching Experience: 16.5 Yrs	
Present Academic Designation: Professor			Present Administrative Designation: -	

Area of research/specialization and Courses Delivered
<p>Research domain/interests/areas</p> <ol style="list-style-type: none"> 1. Process Metallurgy (Slag-Metal interactions), 2. High Temperature Material Properties (Slags, Glass, Salts and Metals) 3. Materials for Energy (Heat Transfer Fluids and Thermal Energy Storage for Solar Thermal Applications, Batteries and Fuel Cells) 4. Composite Materials <p>Courses Delivered</p> <ol style="list-style-type: none"> 1. Materials Science & Metallurgy 2. Manufacturing of Composites 3. Hydrogen Energy and Fuel Cells 4. Energy Storage and Fuel Cells for Electric Vehicles 5. Waste To Wealth

Recognition as a teacher by any University	UG: Yes	PG: Yes	Ph.D : Yes
<p>Details of Recognitions</p> <ol style="list-style-type: none"> 1. Recognition as a PhD Guide for Somaiya Vidyavihar 2. Approved UG and PG Faculty of University of Mumbai 			

Education					
Examination	Name of the Degree	University/Board	Institute/College	Year	CPI/SPI/ %Marks
Ph.D	PhD (Materials Process Science)	-	KTH Sweden	2010	-
PG	MTech (Process Metallurgy)	-	IIT Bombay	2007	9.42
UG	BTech (Mechanical)	Calicut University	GCE Kannur	1999	74

Notable Experience Details					
Sr. No	Name of the organization	Designation	Date of Joining	Date of Leaving	Experience (Years)
1.	CSIRO	Scientific Officer	2011	2014	3
2.	Essar Steel Ltd	Senior Engineer (R&D)	2007	2008	1

Research Accomplishments and Projects		
No of students pursuing Ph.D as on date: 00		No of students completed Ph.D as on date: 00
No of students completed PG thesis / Project work as on date: 08		No of students / groups completed UG projects as on date: 05
Publications Total: 57	Number of Peer review Journal papers: 21	Number of Conference papers: 36
<p>Details of Publications:</p> <p>International Journals</p>		

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1. V Shrotri and L Muhmood, "Some Investigation to increase the peak operating time of a Concentrating Solar Power Plant with focus on Heat Transfer Fluids", Journal of The Institution of Engineers (India): Series C, **2021**
2. R.K. Lenka, P.K. Patro, Vivek Patel, L. Muhmood, T. Mahata," Comparative investigation on the functional properties of alkaline earth metal (Ca, Ba, Sr) doped $\text{Nd}_2\text{NiO}_{4+\delta}$ oxygen electrode material for SOFC applications", Journal of Alloys and Compounds, Volume 860, **2021**, 158490
3. L Muhmood, "[Modeling for Thermal Conductivity of Ternary Molten Nitrate Salts Using Unit Cell Concept](#)", *International Journal of Thermophysics*, 41 (9) 1-12, **2020**.
4. V Shrotri and L Muhmood, "Experimental and Modelling studies on Density of $\text{Ca}(\text{NO}_3)_2\text{-NaNO}_3\text{-KNO}_3$ ternary salts with focus on Calcium nitrate density prediction", *International Journal of Thermophysics*, 41, 1-17, **2020**.
5. V Shrotri and L Muhmood, "Application of Geometric Modelling for calculation of viscosity and density of LiNO_3 and CsNO_3 based ternary nitrate salt systems", CALPHAD, 68, **2020**, 101749.
6. LJ Wang, NN Viswanathan, L Muhmood, E Kapilashrami, S Seetharaman, "[Some aspects of interfacial phenomena in steelmaking and refining](#)", 47 (4), Metallurgical and Materials Transactions B, pp: 2107-2113, **2016**.
7. M Wegener, L Muhmood, S Sun, AV Deev, "[Surface Tension Measurements of Calcia-Alumina Slags: A Comparison of Dynamic Methods](#)", 46 (1), Metallurgical and Materials Transactions B, pp: 316-327, **2015**.
8. M Wegener, Luckman Muhmood, Shouyi Sun and Alex V Deev," Formation and breakup of molten oxide jets under periodic excitation", AIChE, 60(9), pp. 3350-3361, **2014**.
9. Till Kyulmer, Mirco Wegner, Luckman Muhmood, Shouyi Sun and Alex V Deev, "Controlled disintegration of multiple jets of molten slags", ISIJ, 52(12), **2014**.
10. Mirco Wegner, Luckman Muhmood, Shouyi Sun and Alex V Deev, "Formation and breakup of molten oxide jets", Chemical Engineering Science, 105, pp. 143-154, **2014**.
11. Mirco Wegner, Luckman Muhmood, Shouyi Sun and Alex V Deev, "A novel high temperature experimental setup to study the dynamics interfacial phenomena in slags", Industrial and Engineering Chemistry Research, 52 (46), pp. 16444-16456, **2013**.
12. Luckman Muhmood, Anna Semykina and Seshadri Seetharaman, "Some novel studies of thermodynamics, kinetics and transport phenomena in slags", High Temperature Materials and Processes, Vol. 31 (4-5), pp. 351-358, 2012. **2012**.
13. W.Cao, Luckman Muhmood and Seshadri Seethraman, "Sulfur transfer at Slag/Metal Inteface – Impact of Oxygen potential", Metallurgical and Materials Transactions B, Volume 43, Number 2, 363-369, **2012**.
14. Luckman Muhmood, N.N. Viswanathan and Seshadri Seethraman, "Studies of dynamic mass transfer at the slag-metal interface – Interfacial velocity of oxygen", Int. J. Mat. Res., 103(7), pp. 875-883, **2012**.
15. Luckman Muhmood, N.N. Viswanathan and Seshadri Seethraman, "A new approach for the diffusion coefficient evaluation of sulfur in $\text{CaO-SiO}_2\text{-Al}_2\text{O}_3$ slag", Defect and Diffusion Forum, 312-315 , 626-634 , **2011**.
16. Luckman Muhmood, "A new insight to interfacial phenomena occurring at slag-metal interfaces", Steel Res. Intl., 82(12), 1375-1384, **2011**.
17. Luckman Muhmood, N.N. Viswanathan and Seshadri Seethraman, "Some Investigations into the dynamic mass transfer at the slag-metal interface using sulfur: Concept of Interfacial velocity", Metallurgical and Materials Transactions B, Volume 42, Number 3, 460-470, **2011**.
18. Luckman Muhmood, N.N. Viswanathan, Masanori Iwase and Seshadri Seethraman, "Evaluating the Diffusion Coefficient of Sulfur in low silica $\text{CaO-SiO}_2\text{-Al}_2\text{O}_3$ Slag", Metallurgical and Materials Transactions B, Volume 42, Number 2, 274-280, **2011**.
19. Luckman Muhmood, N.N. Viswanathan and Seshadri Seethraman, "A proposal for a novel method to measure the diffusivity of species in slag", Metallurgical and Materials Transactions B , Volume 42,

Number 2, 393-399, **2011**.

20. Luckman Muhmood and Seshadri Seetharaman, "Density Measurements of low silica CaO-SiO₂-Al₂O₃ slags", Metallurgical and Materials Transactions B, Volume 41, Number 4, 833-840, **2010**.
21. Luckman Muhmood, Satish Vitta and D. Venkateswaran, "Cementitious and pozzolanic behavior of Electric Arc Furnace steel slags", **Cement and Concrete Research**, Volume 39, Issue 2, Pages 102-109, **2009**.

National Journals

Nil

Conferences

1. Varun Shrotri and Luckman Muhmood," Some Investigations On Ca(NO₃)₂-NaNO₃-KNO₃ Ternary Salts For Solar Thermal Applications", MOLTEN-2020, South Korea, May 2020.
2. Luckman Muhmood, "B₂O₃ based molten oxides for heat transfer applications in Concentrating Solar Power Plants", MOLTEN 2020, South Korea, May 2020.
3. Varun Shrotri and Luckman Muhmood, "Some investigations to enhance the peak operating time of a Concentrating Solar Power Plants with focus on Heat Transfer Fluids", International Conference on Energy and Sustainable Development, Jadavpur University, Kolkata, Feb. 14-15, 2020.
4. Shubhankar Kaisare, Jayesh Parab, Arnab Lahiri and Luckman Muhmood," Hydration studies of Ferro-Chrome Slag for Cementitious applications", MetWaste2020, IIT-BHU, 22-23 Feb., 2020.
5. Siddesh Pawar, Varun Shrotri and Luckman Muhmood, "Stabilizing molten salts for high temperature CSP applications", ICONSAT-20, S N Bose Centre for Basic Sciences, Kolkata March 5-7, 2020.
6. Pranjali Gandhre, R K Lenka, L Muhmood, P K Patro and T Mahata, "Preparation and electrochemical characterization of Ca doped Nd₂NiO₄ solid oxide fuel cell cathode material, International Conference on Powder Metallurgy and particulate materials (PM20), Mumbai , 19th – 21st February, 2020
7. G. V. Jawale, B. C. Nailwal, R. K. Lenka, L Muhmood, K. Singh, R. C. Bindal, Soumitra Kar, " Fabrication and Characterization of Porous SS Supported Composite Palladium Membranes for Separation and Recovery of Hydrogen at High Pressure", International Conference on Powder Metallurgy and particulate materials (PM20), Mumbai , 19th – 21st February, 2020.
8. G. V. Jawale, B. C. Nailwal, N Goswami, R. K. Lenka, S. Amit, L Muhmood, K. Singh, R. C. Bindal, Soumitra Kar, "Fabrication and Characterization of Composite Palladium Membranes for Separation and Recovery of Hydrogen in Bio-jet Fuel Production", International Conference on "Innovation and Opportunities in Chemical Engineering for Sustainable Environment and Energy" (IOCSE 2020), Raja Balwant Singh Engineering Technical Campus, Bichpuri, Agra, 27th-29th, February, 2020.
9. Lionel d'souza, Luckman Muhmood and Lenka R K, "Effect of Cu addition on the electrochemical performance of LaNi_{0.6}Fe_{0.4}O₃ cathode materials for SOFC applications", APMA 2019, Pune, Feb. **2019**.
10. Lokesh Bele, Lenka R K , Patro P K, Muhmood L , T Mahata and Sinha P K, "Performance evaluation of Mn and Fe doped SrCo_{0.9}Nb_{0.1}O_{3-δ} cathode for IT-SOFC application", IOP Conference Series – Materials Science and Engineering, 310 (**2018**), 012107.
11. Luckman Muhmood, Mirco Wegner, Shouyi Sun and Alex V Deev," Surface tension studies of molten CaO-Al₂O₃ jets – Oscillating Jet Method ", 5th International Slag Valorization Symposium, Leuven, Belgium, April 3-5, **2017**.
12. Hema Tiwari, R K Lenka and Luckman Muhmood, "Synthesis and Fabrication of Molybdenum Doped Ni- YSZ Anode Material for IT-SOFC Applications", IUMRS-ICYRAM 2016, December **2016**, IISc Bangalore
13. Vivek Patel, R.K Lenka, P.K.Patro, Amit Shah, L Muhmood, T. Mahata and P.K Sinha," Electrochemical performance evaluation of Nd_{1.7}Sr_{0.3}NiO₄ as a cathode for IT-SOFC applications", International Conference on Powder Metallurgy & Particulate Materials (PM-16), February **2016**, Pune.
14. Luckman Muhmood, Mirco Wegner, Shouyi Sun and Alex V Deev," Control of molten CaO – Al₂O₃ oxide jets with focus on thermophysical property measurements and some limitations", MOLTEN-2016, Seattle, US, May 22-26, 2016.
15. Luckman Muhmood, N.N. Viswanathan and Seshadri Seetharaman, "Modelling and Experimental studies of Diffusivity of sulphur and its relevance in observing surface oscillations at the slag metal

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- interface through X-ray imaging” MOLTEN-2016, Seattle, US, May 22-26, 2016.
16. Luckman Muhmood, N.N. Viswanathan and Seshadri Seetharaman, “Modelling and Experimental studies of Diffusivity of sulphur and its relevance in observing surface oscillations at the slag metal interface through X-ray imaging” MOLTEN-2016, Seattle, US, May 22-26, **2016**.
 17. Lijun Wang, N N Viswanathan, Luckman Muhmood, Era Kapliarashmi and Seshadri Seetharaman, “*Some aspects of interfacial phenomena in steelmaking and refining*”, , CTSSC-EMI Symposium , September **2015**, Tokyo, Japan.
 18. Mirco Wegener, Luckman Muhmood , Shouyi Sun and Alex Deev ,“Towards a slag droplet heat exchanger- capillary break up from molten oxide jets”, , 5th Annual High Temperature Processing Symposium , 3-4 February **2014**; Swinburne University of Technology, Hawthorn, Vic, Australia.
 19. Luckman Muhmood, Lijun Wang and Seshadri Seetharaman, “Studies of the properties of slag towards applications”, Science and Technology of Ironmaking and Steelmaking, CSIR-NML International Conference, December **2013**, Jamshedpur India.
 20. Luckman Muhmood and Mirco Wegener , “Experimental investigations on the dynamics of interfacial phenomena in synthetic blast furnace slags”, 4th Annual High Temperature Processing Symposium , 4-5 February **2013**; Swinburne University of Technology, Hawthorn, Vic, Australia. 74-75.
 21. Luckman Muhmood, N.N. Viswanathan and Seshadri Seetharaman , “Evaluating the Chemical Diffusion Coefficient of Sulfur in slag by metal analysis: Model Concept and Experiments”, Ninth International Conference on Molten Slags, Fluxes and Salts, Beijing, China, May 27-30, (W052), **2012**.
 22. Luckman Muhmood, N.N. Viswanathan and Seshadri Seetharaman, “Concepts and Measurement of Velocities and Viscosities at the Slag-Metal Interface”, Ninth International Conference on Molten Slags, Fluxes and Salts, Beijing, China, May 27-30, (W053), **2012**.
 23. Luckman Muhmood, Lijun Wang and Seshadri Seetharaman, “Density measurements of low silica CaO-SiO₂-Al₂O₃ slags: slag structure discussions”, Ninth International Conference on Molten Slags, Fluxes and Salts, Beijing, China, May 27-30, (W054), **2012**.
 24. Aida Abbasalizadeh, Luckman Muhmood ,Alexander McLean and Seshadri Seetharaman, “A sessile droplet study of iron-carbon-sulfur alloys on alumina substrate”, Ninth International Conference on Molten Slags, Fluxes and Salts, Beijing, China, May 27-30, (W108), **2012**.
 25. Weimin Cao, Luckman Muhmood and Seshadri Seetharaman, “Investigation of the impact of oxygen potential on sulfur mass transfer at slag/iron interface”, Ninth International Conference on Molten Slags, Fluxes and Salts, Beijing, China, May 27-30, (W072), **2012**.
 26. Luckman Muhmood, “Molten Slag Density Measurements with Focus on Slag Structures”, 4th Annual High Temperature Processing Symposium 2012; 6-7 February 2012; Swinburne University of Technology, Hawthorn, Vic, Australia. **2012**. 74-75.
 27. Luckman Muhmood, and S.Seetharaman, “Determination of some thermophysical properties in slag or slag-metal systems”, Seetharaman seminar; materials processing towards properties, Sigtuna, Sweden, 14-15 June, **2010**.
 28. Luckman Muhmood, N.N Viswanathan and S.Seetharaman,'Evaluating the Diffusion Coefficient of Sulfur in CaO-SiO₂-Al₂O₃ Slag', 6th International Conference on Diffusion in Solids and Liquids, Paris, France, 5-7 July, **2010**.
 29. A.K Das, T. Bhaskar, L. Muhmood, “Zero Waste Management Journey at Essar Steel”, International Seminar on Waste Management in Iron & Steel Industry, Rourkela, India, 9-10 May **2008**.
 30. D. Venkateswaran, S.Vitta, L. Muhmood, “Treatment & characterization of Electric Arc Furnace Slag (EAF) for its effective utilization in cementitious products”, published in the Global Slag Magazine, October, **2007**.
 31. D. Venkateswaran, S.Vitta and L. Muhmood, “Use of Electric Arc Furnace slag for Cementitious Products”, Tenth NCB International Seminar on Cement and Building Materials, held at New Delhi, India, 27-30 November, **2007**.
 32. L. Muhmood, S.Vitta and D. Venkateswaran, “Treatment and charecterization of Electric Arc Furnace Slag for Cementitious properties presented at R’07 World Congress, Davos, Switzerland, September 3-5, **2007**.
 33. L. Muhmood, S.Vitta and D. Venkateswaran, “An Investigation into the use of Electric Arc Furnace Slag as Cementitious Material”, International Seminar on Mineral Processing Technology (MPT-2007), at IIT Bombay, 23-24 February, **2007**.
 34. D. Venkateswaran, S.Vitta and L. Muhmood, “Treatment & characterization of Electric Arc Furnace Slag (EAF) for its effective utilization in cementitious products” presented in the Second Global Slag Conference, held at Bangkok, Thailand, 20-21 November, **2006**.
 35. Siddhesh C Pawar, Varun Shrotri, Luckman Muhmood, “Stabilizing Molten Salts Through Additives

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<p>for High Temperature CSP Applications”, Advances in Clean Energy Technologies, Ed(s): Baredar P.V., Tangellapalli S., Solanki C.S., Springer Proceedings in Energy. Springer, Singapore.,2021, 13-21.</p> <p>36. Varun Shrotri, Luckman Muhmood, “Investigations on the Use of Molten Oxides for High Temperature Heat Transfer in Solar Power Plants”, Advances in Clean Energy Technologies, Ed(s): Baredar P.V., Tangellapalli S., Solanki C.S., Springer Proceedings in Energy. Springer, Singapore.,2021, 45-55.</p>		
Books/Book Chapters – nil		
Patents/Copy Rights Nil		
No of Research / consultancy / projects completed: 01 Rs: 32,51, 600/-	No of Research / consultancy / projects on-going: 01 Rs: 45,78,200/-	No of Research / consultancy / projects on applied as on date: 0 Rs: 0/-
<p>Details of Research / consultancy / projects:</p> <p>Completed</p> <p>1. DST-SERB – Core Research Grant for the project titled “Oxide Mixtures as heat transfer fluids in Concentrating Solar Power Plant”, Amount – INR 32,51,600/-, 2017-2020</p> <p>On-going</p> <p>1. DST-SERB – Core Research Grant for the project titled “Modifications on Ternary Nitrate Salts with focus on enhancing thermal stability and heat transfer characteristics for Concentrating Solar Thermal Applications”, Amount – INR 45,78,200/-, 2023-2026</p> <p>Applied - Nil</p>		
IPR/ Copyrights - Nil		

FDPs/Seminars/Workshops/Training Programs Attended/ Organized/ Delivered
<p>Attended –</p> <ol style="list-style-type: none"> 1. Aluminium Metallurgy for the Industry – 2 day course organized by ASM International India Chapter, 2019 2. Nanoscience and Nanotechnology – Fundamentals, Synthesis and Applications, 5 day course at VJTI Mumbai, India, 2017 3. Working with People (3 day course) at CSIRO, Melbourne, Australia, 2012. 4. Publishing with Impact (2 day course) at CSIRO, Melbourne, Australia, 2012. 5. Project Management Fundamentals (2 day course) at CSIRO, Melbourne, Australia, 2013. 6. Thermocalc Software, 5 day course at KTH Stockholm, Sweden, 2009
Organized – Nil
Delivered – Nil

Notable Key Scholastic Achievements
1. Awarded the TMS Extraction and Processing Metallurgy Science Award 2017, San Diego, USA, 2017
2. Won the best paper award by a postdoctoral fellow at CSIRO, Australia in February, 2014
3. Awarded the 12 th Willy Korf Award for young excellence at the AMM Steel Success Strategies Congress (SSS XXVI), at New York, USA, 2011 .
4. Awarded C J Yngström scholarship for conducting research work at Carnegie Mellon University, Pittsburgh ,USA, 2010

Notable Positions and Responsibility
1. Member of the ASM Advanced Manufacturing Committee , ASM International, 2023
2. Organizing Committee Member of the Innovation Pavilion for MET-HTS International Conference and Exhibition – Mumbai, 2022
3. Executive Committee Member of ASM India Chapter – for Student Outreach Activities
4. Invited as guest reviewer for the 3 rd National Plan for Research, Development and Innovation for the period 2015-2020 (PNCDI III), organized by the Ministry of National Education and Scientific Research, Romania, 2015

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5.	Invited as an external reviewer by the National Research Council, Romania, 2012
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Date: / / **2023**

Signature of Faculty Member