



## دونابوينا سري ماها فيشنو

أستاذ مساعد

علوم الحياة والكيمياء – شعبة

كلية العلوم والآداب

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يعمل في الجامعة: منذ 2014

الحالة الاجتماعية: Married.....

حصل على الدكتوراه في الكيمياء من معهد جامعة هومي بهابا الوطنية ، مومباي ، الهند في عام 2014 ، ماجستير في الكيمياء من جامعة بونديشيري في الهند في عام 2008 ، وبكالوريوس في الكيمياء من جامعة بونديشيري في الهند في عام 2006. اهتماماته البحثية هي: كيمياء المواد ، كيمياء الملح المنصهر ، الكيمياء الكهربائية ، التآكل ، التعدين الكهربائي ، مواد الغرس الطبي الحيوي القائمة على Ti ، مواد تخزين الطاقة والمواد النانوية

### المؤهلات الأكاديمية

Ph.D. (Chemistry), Homi Bhaba National Institute, 2014

M.Sc. (Chemistry), Pondicherry University, 2008

B.Sc. (Chemistry), Pondicherry University, 2006

### أنشطة التدريس

Materials Chemistry

Physical Chemistry for Engineers

Biophysical Chemistry

Analytical Chemistry for Pharmacy

Analytical Chemistry-II

الأنشطة البحثية

الاهتمامات البحثية -

Materials chemistry, molten salt chemistry, Electrochemistry, Corrosion, Electrometallurgy, Ti based biomedical implant materials, Energy storage materials and Nanomaterials

العرض في المؤتمرات -

- Synthesis of nano-sized high-entropy carbide powder by electrochemical deoxidation for possible application in supercapacitors. 11th International Workshop on Advanced Materials (IWAM-2019), Ras Al Khaimah, UAE., 24th - 26th February, 2019
- Porous Ti alloys with non-cytotoxic Nb and Sn for body-implant applications. 11th International Workshop on Advanced Materials (IWAM-2019), Ras Al Khaimah, UAE., 24th - 26th February, 2019
- Electrochemical reduction of sintered titania powders to titanium metal in calcium chloride melt. Minerals and Metals Production from Mine to Market. Trinity Hall, Cambridge, United Kingdom. , 15th - 16th, December 2015
- Electrochemical synthesis of Ti matrix based composite materials in molten salts. 6th International round table conference on titanium production in molten salts (TiRT - 2018), (Reykjavik University, Reykjavik, Iceland., 10-13th June (2018
- Electrochemical Synthesis of Silicon Carbide in Molten Calcium Chloride. 2nd International Conference on Electrochemical Science and Technology (ICONEST - 2017), Indian Institute of Science Campus, Bengaluru, India., 10-12th August (2017
- Direct electrochemical synthesis of Ti-35Nb-7.9Sn alloy from mixed oxide discs in CaCl<sub>2</sub> melt. Molten Salt Discussion Group - Summer Research Meeting-2017, School of Chemical and Environmental Engineering, University of Nottingham, organized by Royal Society of Chemistry, (Nottingham, UK., 4th -6th July (2017
- Molten salt electrochemical synthesis of porous titanium-niobium biomedical alloys. 26th EUCHEM conference on Molten Salts and Ionic Liquids, Vienna, Austria, 3rd -8th July, 2016
- Electrochemical synthesis of ferrochromium by electro-reduction in molten salts. 26th EUCHEM conference on Molten Salts and Ionic Liquids, Vienna, Austria, 3rd - 8th July, 2016
- Studies on the Electro-deoxidation of CeO<sub>2</sub> in the FFC Cambridge process. Second International Conference on Advances in Nuclear Materials (ANM), Mumbai, India, February 9-11, 2011
- Electrodeoxidation of niobium pentoxide in molten calcium chloride medium. 3rd International Symposium on Materials Chemistry (ISMC), Bhabha Atomic Research Centre, Trombay, Mumbai, December 7-11, 2010
- Preliminary results on the role of calcium during electro-reduction of solid oxides in molten calcium chloride medium. DAE-BRNS Biennial Symposium on Emerging trends in separation Science and Technology (SESTEC), Mumbai, India, February 27 - March 01, 2012
- Estimation of uranium in UO<sub>2</sub> partially reduced by electro-deoxidation. Fourth International Symposium on Nuclear Analytical Chemistry (NAC-IV), Bhabha Atomic Research Centre, Mumbai, India, November 15-19, 2010
- Studies on electro-deoxidation of metal oxides in molten calcium chloride medium. Chemistry Research Scholars Meet (CRSM), IGCAR, Kalpakkam, India, July 14-15, 2011
- An innovative study of the electrochemical reduction of solid SiO<sub>2</sub> in LiCl and CaCl<sub>2</sub> melts, DAE-

BRNS 4th Interdisciplinary Symposium on Materials Chemistry (ISMC), BARC, Trombay, Mumbai, India, December 11-15, 2012

Studies on the direct electrochemical reduction of Nb<sub>2</sub>O<sub>5</sub> in MCl (M=Na and K), CaCl<sub>2</sub>-75 mol % KCl and CaCl<sub>2</sub> melts, International Conference on Vistas in Chemistry (ICVC), IGCAR, Kalpakkam, India, October 11-13, 2011

Galvanostatic studies on the electro-deoxidation of solid titanium dioxide in molten calcium chloride, FRAY International symposium on Metals and Materials Processing in a clean environment, Cancun, Mexico, November-2011

## المنشورات -

### مقال:

1. [Factors controlling the synthesis of porous Ti-based biomedical alloys by electrochemical \(deoxidation in molten salts\)](#), Metallurgical and Materials Transactions B (2021) (in press)
2. Corrosion performance of electrochemically prepared Ti-5Ta-2Nb alloy in concentrated (nitric acid, Materials Today Communications 26 (2021) 1-11 (Article No. 101786)
3. Microwave-assisted synthesis of palladium nanoparticles using Frankincense resin and (evaluation of their catalytic properties, Materials Letters 278 (2020) 1-4 (Article No. 128427)
4. Facile and scalable electrochemical synthesis of Ta-Nb alloy powders for capacitors, 2020 (Journal of the Electrochemical Society 167 (2020) 1-9 (Article No. 022504)
5. Preparation of refractory high-entropy alloys by electro-deoxidation and the effect of heat treatment on microstructure and hardness, JOM 72 (2020) 3895-3905
6. [Facile Electrochemical Synthesis of Nanoscale \(TiNbTaZrHf\)C High-entropy Carbide Powder](#), Angewandte Chemie International Edition, 59 (2020) 1-7
7. Molten salt based direct solid state electrochemical de-oxidation of metal oxides to metal: Our experience at IGCAR, SMC Bulletin 10 (2019) 70-87
8. Phase composition, microstructure, corrosion resistance and mechanical properties of molten salt electrochemically synthesised Ti-Nb-Sn biomedical alloys, Materials Transactions 60 (2019) 422-428
9. Electrochemical synthesis of porous Ti-Nb alloys for biomedical applications, Materials Science and Engineering C 96 (2019) 466-478
10. Molten Salt Electrochemical Synthesis, Heat Treatment and Microhardness of Ti-5Ta-2Nb Alloy, Materials Transactions 60 (2019) 391-399
11. Electrochemical Conversion of Oxide Spinel into High-Entropy Alloy, Journal of Alloys and Compounds 776 (2019) 133-141
12. Direct electrochemical preparation of silicon carbide in calcium chloride melt and its nitridation behavior, Journal of the Electrochemical Society 165 (2018) D731-D742
13. Direct electrochemical synthesis of high-entropy alloys from metal oxides, Applied Materials Today 9 (2017) 111-121
14. Measurement of counter electrode potential during cyclic voltammetry and demonstration on molten salt electrochemical cells, International Research Journal of Pure and Applied Chemistry 15 (2017) 1-13
15. Difference in the mechanism of electrochemical deoxidation of conducting and non-conducting solid oxide preforms: An experimental demonstration with TiO<sub>2</sub> and SiO<sub>2</sub> pellet electrodes in CaCl<sub>2</sub> melt, Research Reviews: Journal of Materials Science 5 (2017) 1-12

- Factors influencing the direct electrochemical reduction of Nb<sub>2</sub>O<sub>5</sub> pellets to Nb metal in 2017 .16  
molten chloride salts, *Acta Metallurgica Sinica (Engl. Lett.)* 30 (2017) 218-227
- Electrochemical conversion of solid Nb<sub>2</sub>O<sub>5</sub> to Nb in sodium chloride melt as proof of 2016 .17  
oxygen ionisation mechanism of electrodeoxidation, *Journal of Alloys and Compounds* 677 (2016)  
258-265
- Electrochemical characterisation of CaCl<sub>2</sub> deficient LiCl-KCl-CaCl<sub>2</sub> eutectic melt and 2016 .18  
electro-deoxidation of solid UO<sub>2</sub>, *Journal of Nuclear Materials*, 470 (2016) 179-186
- Corrosion of high density graphite anodes during direct electrochemical de-oxidation of 2015 .19  
solid oxides in molten CaCl<sub>2</sub> medium, *Carbon*, 93 (2015) 782-792
- Electrochemical reduction of TiO<sub>2</sub> powders in molten calcium chloride, *Electrochimica* 2015 .20  
*Acta*, 159 (2015) 124-130
- A novel technique for estimation of metallic uranium using proton exchange membrane 2014 .21  
(based hydrogen sensor, *Transactions of Indian Institute of Metals*, 67 (5) 691-699 (2014
- Factors influencing the direct electrochemical reduction of UO<sub>2</sub> pellets to uranium metal 2013 .22  
(in CaCl<sub>2</sub>-48mol% NaCl melt, *Journal of Electrochemical Society*, 160 (11) D583-D592 (2013
- Mechanism of direct electrochemical reduction of solid UO<sub>2</sub> to uranium metal in 2013 .23  
CaCl<sub>2</sub>-48mol%NaCl melt, *Journal of the Electrochemical Society*, 160 (9) (2013) D394-D402
- A study of the reaction pathways during electrochemical reduction of dense Nb<sub>2</sub>O<sub>5</sub> 2013 .24  
pellets in molten CaCl<sub>2</sub> medium, *Electrochimica Acta*, 100 (2013) 51-62
- Determination of the extent of reduction of dense UO<sub>2</sub> cathodes from direct 2012 .25  
electrochemical reduction studies in molten chloride medium, *Journal of Nuclear Materials*, 427  
(2012) 200-208

#### الخبرة الإدارية

Member of DBSC Quality Management Group :الآن- 2020

DBSC Risk Management Officer :الآن- 2020

B.Sc., Chemistry Program Coordinator :الآن- 2020

#### العضوية في الهيئات المهنية

Member of Royal Society of Chemistry (MRSC), United Kingdom :الآن-2015

Member of Society for Materials Chemistry (MSMC), India :الآن-2011

Dr. Dunaboyina Sri Maha Vishnu obtained his B.Sc. (Chemistry) and M.Sc. (Chemistry) degrees from Pondicherry University, India and Ph.D. (Chemistry) degree in 2014 from Homi Bhabha National Institute, Mumbai, India. His Ph.D. was in the area of non-aqueous electrochemistry and electroanalytical chemistry with particular emphasis on electrochemical synthesis of materials and their characterization using advanced techniques. Later, he worked at the Department of Materials Science and Metallurgy, University of Cambridge, UK during the period from 17/11/2014 to 07/09/2018. He has been working on various research projects such as developing porous Ti based biomedical alloys for

body implant applications and their corrosion chemistry, synthesis of carbon and carbide based nanomaterials for their energy storage applications in lithium ion batteries and supercapacitors, non-aqueous electrochemistry and electrometallurgy for synthesis of novel materials, electrochemical synthesis of alloys and composite materials and evaluation of corrosion behaviour of structural alloys used in petroleum, petrochemical and chemical industries. Dr Vishnu has extensive hands-on experience in handling a remarkably wide range of laboratory equipment. This includes regular laboratory equipment, such as high-temperature furnaces, glove boxes, electrochemical retorts, ball mills, cutting machines, grinding and polishing machines, and sputter coaters; electrochemical instruments, such as potentiostats, impedance analysers, and data acquisition systems; equipment for advanced materials characterisation techniques, such as X-ray diffractometer (XRD), scanning electron microscope with energy-dispersive X-ray analyser (SEM-EDX), transmission electron microscope, simultaneous thermogravimetric analyser and differential scanning calorimeter (TGA/DSC), Raman spectrophotometer, and optical microscope; advanced analytical instruments, such as ICP-OES, and metallurgical oxygen analyser; as well as mechanical testing instruments, such as 4-point bend tester and hardness tester. So far he has published 18 international research articles with many more under review/preparation pending publication. He has presented his research work at 23 international conferences/seminars/workshops through oral and poster presentations. Currently he is an active reviewer for the well known international journals such as Electrochimica Acta, Journal of Electrochemical Society, Journal of Materials Science, Transactions of Nonferrous Metals Society of China, Transactions of the Institutions of Mining and Metallurgy Journals (TIIM C) and so on. He is a Member of Royal Society of Chemistry (MRSC, Membership No. 590988), UK since 2015 and Member of .Society for Materials Chemistry (SMC, Membership No. 446), Mumbai, India since 2011

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