Dr. (Mrs.) L. Cindrella
Professor (HAG)
Department of Chemistry
National Institute of Technology
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Educational Qualification: M.Sc., Ph. D.

Ph. D. Thesis title: "Some investigations in Solar thermal equipments" - Solar selective Coatings and Convection suppression device (Guide: Dr. CE Sooriamoothy, Madurai Kamaraj University, India)

Training abroad:

1. Technical Cooperation Training Programme at the University of Salford, England, on Chemical storage of solar energy, Jan.1997 - July 1997, under the UK-India RECs Project. (Guide: Dr. Alan Dyer, University of Salford, England).
2. Technical Education Quality Improvement Programme (TEQIP) training on Fuel Cell at the Arizona state University, USA, April 2007 - May 2007. (Supervisor: Dr. A.M. Kannan, Arizona State University, USA)
3. Research on Fuel cell components at Arizona State University (ASU), USA, during Jan.2009, under Global Inter institutional collaboration scheme, ASU, USA.
4. Leadership programme at NTU, Singapore, Feb.2019.

Countries visited for Research/ Professional Activities:

UK, USA, France, Italy, Singapore

Employment record:

Lecturer, Regional Engineering College (REC), Trichy, India.
Sep.1992-Oct.1997

Senior Lecturer, REC, Trichy, India.
Nov.1997-Oct.2002

Assistant Professor, REC (renamed as NIT in 2004), Trichy, India.
Nov.2002-Dec.2005

Associate Professor, National Institute of Technology (NIT), Trichy, India.
Jan.2006-Jun.2009

Professor, NIT, Trichy, India.
Jul.2009-Apr.2019

Professor (HAG), NIT, Trichy, India.
Since May 2019

Details of professional training and research experience:

Research experience: 32 Years
Teaching experience: 27 Years

i. Currently engaged in the study of fuel cell and energy materials.
ii. Preparation of conducting polyaniline blends.
iii. Synthesis of nano crystalline salt encapsulated zeolite for solar energy storage.
iv. Structure - Property optimization of compounds of biological importance.
v. Selected for Technical Cooperation Training Programme at the University of Salford, England, on Chemical storage of Solar energy, 1997, under the UK - India RECs project.
vi. Attended the “British annual Zeolite Convention” at Manchester, U.K., April ’97.
vii. Attended a training programme on "Differential Scanning Calorimetry" at PerkinElmer, London, U.K., June '97.
viii. Attended a workshop on "Solar energy", at the Center for Alternative Technology, Machynlleth, Wales, U.K., 1997.
ix. Have got practical experience on electro deposition techniques through intensive laboratory work at CECRI, Karaikudi, India, during July - October 1989.
x. Carried out a systematic study on the optimization of the electro chemical baths to produce quality selective coatings, testing and characterization of the coatings by different instrumental techniques, proposed a new method of fabrication of convection suppression devices for application in solar flat plate collector (Ph.D. research work).

Projects undertaken:

Completed:

1. Development of metallic solar selective coatings from low concentration electrolyte, funded by UGC, India, 1999.
2. Aluminium-air high energy fuel cell, Tamilnadu State Council for Science and Technology funded, 2000.
3. Development of metallic solar selective coatings (for application in solar cooker), funded by UGC, India, 2001.
4. Optical Nano fillers, funded by Tamilnadu State Council for Science and Technology, India, 2005.
5. Preparation of free-standing films of conducting polyaniline based on structure-property optimization for use in photo electrochemical devices, UGC funded, 2005-2007.
6. Fuel Cell Components, Inter-Institutional collaborative research under the scheme of Global Engagement, funded by Arizonal State University, USA, 2008-2009.
7. Functionally impregnated Zeolite based potassium sensor, funded by DST, India, 2011-2012.
8. Radiation capped, stagnation temperature improved, wide spectrum responsive solar selective coatings for solar thermal systems, funded by CSIR, India, 2014-2017.

Current:

1. Development of Unitized MEAs and Fuel cell system integration (1 KW) for Stationary and Transportation Applications, SPARC, GoI, 2019-2021.

Ph.D. Thesis guidance:

Guided 6 Students, Guiding 8 Students

M.Phil. Thesis guidance:

Guided 2 Students

M.Tech. Project guidance:

Guided 1 Student

M.Sc. Projects guidance:

Guided 56 Students, Guiding 3 Students

Selected Publications (in the last five years):

1. R. Venkatesan, **L. Cindrella**, Semiconducting composite of chalcone-bridged polythiophene and titania, its ammonia vapor sensing property, Materials Science in Semiconductor Processing, 34, 126-137, 2015.
2. K. Mohanraju, V. Sreejith, R. Ananth, **L. Cindrella**, Enhanced electrocatalytic activity of PANI and $CoFe_2O_4$/PANI composite supported on graphene for fuel cell applications, J. Power Sources, 284, 383-391, 2015.
3. K. Mohanraju, **L. Cindrella,** Electrocatalytic activity of Mn/Cu doped Fe_2O_3-PANI-rGO composites for Fuel cell applications, RSC Adv., 5, 39455-39463, 2015.
4. N. Mohan, **L. Cindrella**, Direct synthesis of Fe-ZSM-5 zeolite and its prospects as efficient electrode material in methanol fuel cell, Materials Science in Semiconductor Processing, 40, 361-368, 2015.
5. **L. Cindrella**, S.Prabhu, CuO-PANI nanostructure with tunable spectral selectivity for solar selective coating application, Applied Surface Science, 378, 242-255, 2016.
6. K. Mohanraju, **L. Cindrella,** One-pot surfactant-free synthesis of high surface area ternary alloys, PtMCo/C (M = Cr, Mn, Fe, Ni, Cu) with enhanced electrocatalytic activity and durability for PEM fuel cell applications, International Journal of Hydrogen energy, 41, 9320-9331, 2016.
7. K. Mohanraju, **L. Cindrella,** Surfactant free synthesis of high surface area Pt@PdM3 (M = Mn, Fe, Co, Ni, Cu) core/shell with enhanced electrocatalytic activity and durability for PEM fuel cell application, New Journal of Chemistry, 40, 8681-8695, 2016.
8. T.Uma, T.Mahalingam, A.Kannan, **L.Cindrella,** PEG based hybrid composite membranes and their properties for H2/O2 fuel cell, International Journal of Hydrogen energy, 41, 10896-10906, 2016.
9. K. Mohanraju, P. S. Kirankumar, **L. Cindrella**, Oh Joong Kwon, Enhanced electrocatalytic activity of Pt decorated Spinals (M_3O_4, M = Mn, Fe, Co)/C for oxygen reduction reaction in PEM fuel cell and their evaluation by hydrodynamic techniques, Journal of electroanalytical Chemistry, 794, 164-174, 2017.
10. S.Prabhu, **L. Cindrella,** Oh Joong Kwon, K. Mohanraju, Superhydrophilic and self-cleaning rGO-TiO_2 composite coatings for indoor and outdoor photovoltaic applications, Solar energy materials and solar cells, 169, 304-312, 2017.

11. N. Mohan, **L. Cindrella,** Template-free synthesis of Pt-M (M = Ni, Co & Ce) alloys supported on cubic zeolite-A and their catalytic role in methanol oxidation and oxygen reduction reactions characterized by hydrodynamic study, International Journal of hydrogen energy, 42(34), 21719-21731, 2017.
12. S. Prabhu, **L.Cindrella**, Oh Joong Kwon, K. Mohanraju, Green synthesis of rGO-WO_3 composite and its efficient photoelectrochemical water splitting, international journal of hydrogen energy, 42, 29791-29796, 2017.
13. S. Prabhu, S. Manikumar, **L. Cindrella**, O.J. Kwon, Charge transfer and intrinsic electronic properties of rGO-WO_3 nanostructures for efficient photoelectrochemical and photocatalytic applications, Materials Science in Semiconductor Processing, 74, 136–146, 2018.
14. R. Venkatesan, **L. Cindrella**, Semiconductive poly[N1,N4-bis(thiophen-2-ylmethylene)benzene-1,4- diamine]-nickel oxide nanocomposite based ethanol sensor J. Appl. Polym. Sci., 135, DOI: 10.1002/APP.45918, 2018.
15. G. Vinodha, **L. Cindrella**, V. Sithara, John Philip, and P. D. Shima, Synthesis, Characterization, Thermal Conductivity and Rheological Studies in Magnetite-Decorated Graphene Oxide Nanofluids, Journal of Nanofluids Vol. 7, 1–10, 2018.
16. Vinodha Ganesan, **Cindrella Louis**, Shima Porumpathparambil Damodaran, Graphene oxide-wrapped magnetite nanoclusters: A recyclable functional hybrid for fast and highly efficient removal of organic dyes from wastewater, Journal of Environmental Chemical Engineering 6, 2176–2190, 2018.
17. Vinodha Ganesan, **Cindrella Louis**, Shima Porumpathparambil Damodaran, Novel Nanofluids Based on Magnetite Nanoclusters and Investigation on Their Cluster Size-Dependent Thermal Conductivity, J. Phys. Chem. C, 122, 6918−6929, 2018.
18. S. Prabhu, **L. Cindrella**, Oh Joong Kwon and K. Mohanraju, Photoelectrochemical and photocatalytic activity of TiO_2-WO_3 heterostructures boosted by mutual interaction, Materials Science in Semiconductor Processing, 88, 10-19, 2018.
19. R. Venkatesan, **L. Cindrella**, Methyl substituted, azine bridged thiophenes and their structure related surface characteristics, Synthetic Metals, 246, 150-163, 2018.
20. Aneesiya K Rajan, **L.Cindrella,** Studies on new natural dye sensitizers from *Indigofera tinctoria* in dye-sensitized solar cells, Journal of Optical Materials, 88, 39-47, 2019.
21. G. Vinodha, P. D. Shima, **L. Cindrella**, Mesoporous magnetite nanoparticle-decorated graphene oxide nanosheets for efficient electrochemical detection of hydrazine, Journal of Materials Science, 54 (5), 4073-4088, 2019.
22. S. Prabhu, **L. Cindrella**, Oh Joong Kwon and K. Mohanraju, Photoelectrochemical, photocatalytic and photochromic performance of rGO-TiO_2-WO_3 composites, Materials Chemistry and Physics, 224, 217-228, 2019.
23. Aneesiya K Rajan, **L.Cindrella,** Ameliorating the photovoltaic conversion efficiency of ZnO nanorod based dye sensitized solar cells by Strontium doping, Superlattices and Microstructures 128, 14-22, 2019.
24. Vinodha Ganesan, B.B. Lahiri, **Cindrella Louis**, John Philip, Shima P. Damodaran, Size-controlled synthesis of superparamagnetic magnetite nanoclusters for heat generation in an alternating magnetic field, Journal of Molecular Liquids, 281, 315-323, 2019.

Membership in Professional Societies:

1. Life member of Indian Society for Technical Education (ISTE).
2. Life member of Indian Society for Electro Analytical Chemistry (ISEAC).

3. Life Member of Society for Advancement of Electrochemical Sc. & Tech. (SAEST).
4. Life Member of the Chemical Research Society of India (CRSI).

Professional recognition, awards, fellowships received:

a. Selected for Leadership for Academicians Programme (LEAP) at NIT, Trichy-IIIT, SriCity-NTU, Singapore, Feb.2019.
b. Honorary appointment to the Research Board of Advisors, The American Biographical Institute, 2004.
c. Technical Cooperation Training Fellowship (TCT) under the UK-INDIA RECs project and specialized on “Chemical Storage of Solar Energy”, at the University of Salford , England, during Jan.1997 - Jul.1997.
d. Qualified in UGC, NET examination in 1986 and was awarded UGC, JRF during 1.8.1987 - 31.7.1990 and UGC, SRF during 1.8.1990 - 31.7.1992.
e. I rank holder and Gold Medalist in M.Sc., 1986.
f. GRI Merit scholarship in the M.Sc. Course, during 1985 - 1986.
g. I Rank holder in Certificate course in Computer Programming (1986).
h. Prize for proficiency in Chemistry in B.Sc. (1984).
i. National Merit Scholarship at the Secondary stage for talented Children, during 1977-1981.