Dr. A. Manuel Stephan

Senior Principal Scientist

Contact

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Academic Qualifications

M.Sc., M. Phil., Ph.D (Physics)

Experience

Research Experience

24 Years

Additional Responsibilities

Areas of Research

1. Lithium Batteries; Solid Electrolytes; Functionalized Porous Membranes

Research Supervision / Guidance

Program of Study		Completed	Ongoing
Research	PDF	---	
	Ph.D.	02	02
	M.Phil.	--	
Projects	PG	15	---

Publications

International		National		Others
Journals	**Conferences**	**Journals**	**Conferences**	**Books/chapters/ monographs/manuals**
106	65	--	--	03

Funded Research Projects

Ongoing Major Research Projects

S.No.	Title	Funding Agency	Amount (Rs. In lakhs)	Duration
1	Extreme Fast Charging of Lithium Ion Battery for E-Mobility Application	CSIR, New Delhi	**98.00**	2020-2022
2	Organic Radical Energy Storage Devices	CSIR, New Delhi	**85.12**	2020-2022

Completed Major Research Projects

S.No.	Title	Funding Agency	Amount (Rs. In lakhs)	Duration
1	Novel composite polymer electrolytes for lithium batteries	DST, India	20.00	2007-2010
2	Development of polymer-in-ceramic composite electrolytes for energy devices	DAE, India	16.67	2011-2014
3	PEO- based solid polymer electrolytes for lithium sulfur batteries	DST, India	37.61	2016-2019
4	Development of 500W Zinc-Bromine Redox Flow Batteries	CSIR, India	90.00	2016-2017
5	Development of lithium sulfur pouch cells for portable electronic devices and lighting	CSIR, India	89.00	2018-2020
6	Solid microporous materials as electrolytes for energy devices	DST, India	06.30	2017-2019

Patents

1. MOF-incorporated nanocomposite polymer electrolytes for lithium batteries. (Indian Patent 2013 NF 0150)

2. Permselective separators for lithium sulfur batteries (Indian Patent filed)

Distinctive Achievements / Awards

1. JSPS Fellowship, Osaka National Research Institute, Ikeda, **Japan** 2000-2001
2. Post – Doctoral Fellowship, University of Tulsa, Oklahoma, **USA** 2001-2002
3. Brain-Pool Visiting Scientist, Chonbuk National University, **South Korea** 2005-2006
4. Raman Research Fellowship, Politecnico de Torino, **Italy**, 2012-2013
5. Most Cited Article Award from "**European Polymer Journal**" 2011
6. Top Seventy Articles of **CSIR, New Delhi 2016**

7. Best Paper Award "**Energy Storage Materials**" 2016

Events organized in leading roles

Number of Seminars / Conferences / Workshops / Events organized:

Events Participated

Conferences / Seminars / Workshops:

InternationalSeminars: National Seminars:

62

Membership in Professional Bodies

1. MaterialsSociety of India
2. American Chemical Society, USA
3. SAEST, Karaikudi, India

Referee for the International Journals

1. Journal of American Chemical Society
2. Advanced Functional Materials
3. Materials Horizons
4. Journal of Power Sources
5. Journal of Materials Chemistry A

Advisory Board

Associate Editor: Frontiers In Energy (USA)

Resource persons in various capacities

Number of Invited / Special Lectures delivered:

50

Others

1. No. of PhD Thesis Evaluated

   11

2. No. of PhD Public Viva Voce Examinations conducted

   10

Selected Publications (ACS and impact factor < 6.0)

1. S. Shruti, A. Manuel Stephan, Mitigation of polysulfide shuttling by interlayer/permselective separators in lithium sulfur batteries,
   ACS Applied Energy Materials (2020) In press

2. N. Angulakshmi, R. baby Dhanalakshmi, A. Manuel Stephan, Microporous Metal–Organic Framework (MOF)-Based Composite Polymer Electrolyte (CPE) Mitigating Lithium Dendrite Formation in All-Solid-State-Lithium Batteries, **ACS Omega5 (2020) 7885-7894**

3. N. Angulakshmi, R. baby Dhanalakshmi, A. Manuel StephanThe suppression of lithium dendrites by a triazine-based porous organic polymer-laden PEO-based electrolyte and its application for all-solid-state lithium batteries,**Materials Chemistry Frontiers4 (2020) 933-940**

4. S. Shruti, M. Kathiresan, A. Manuel Stephan Charge-Discharge and Interfacial Properties of Ionic Liquid -Added Hybrid Electrolytes for Lithium-Sulfur Batteries, **ACS Omega 4 (2019) 3894-3903**

5. S. Shruti, A. Manuel Stephan S. Shruti, A. Manuel Stephan, N. Angulakshmi, M. H. Alkordi MOF@SiO_2 as permselective material for lithium sulfur batteries, **Journal of Materials Chemistry A 6 (2018) 14623-14632**

6. S. Shruti, M. Kathiresan, M. H. Alkordi, A. Manuel Stephan Improved cycling performance of Li-S cell through superamolecular interactions, **Journal of Physical Chemistry C 122 (2018) 27843-27849**

7. M. Christy, A. Anupriya, K. U. Moon, M. Y. Oh, K.S. Nahm, A. Manuel Stephan Role of solvents on the oxygen reduction and evolution of rechargeable Li-O_2 battery, **Journal of Power Sources 342 (2017) 825-835**

8. M. Raja, S. Shruti, N. Angulakhsmi, A. Manuel Stephan, High performance multi-functional trilayer membranes as permselective separators for lithium–sulfur batteries, **Inorganic Chemistry Frontiers 4 (2020)1013-1021**

9. J.R. Nair, C. Gerbaldi, F. Bella, N. Angulakshmi, A. Manuel Stephan Nanofibril-laden gel composite electrolytes for lithium-sulfur batteries **Energy Storage Materials 3 (2016) 69-76** (**Best Paper award in 2016**)

10. N. Angulakshmi, R. Senthil Kumar, M. AnbuKulandainathan, A. Manuel StephanComposite polymer electrolytes encompassing MOF- A new strategy for all-solid-state lithium batteries,**Journal of Physical Chemistry C 118 (2014) 24240-24247**

11. C. Gerbaldi, J.R.Nair, M.A. K. Nathan, R. Senthil Kumar, A. Manuel StephanInnovative high performing metal organic framework (MOF)-laden nanocomposite polymer electrolytes for all-solid-state lithium batteries, **Journal of Materials Chemistry A 2 (2014) 9948.**

12. M. Raja, T. Prem Kumar, A. Manuel Stepha**n** Thin, flexible and thermally stable ceramic membrane for lithium-ion batteries,**Journal of Membrane Science 471 (2014) 103-109**

13. F. Bella, R. Bongiovanni, R. Senthil Kumar, M.A.K.Nathan, A. Manuel Stephan Light cured networks containing metal organic frameworks as efficient and durable polymer electrolytes for dye-sensitized solar cells, **Journal of Materials Chemistry A 1 (2013) 9033-9036**

14. N. Sutradhar, S.K.Phari, M. Jeyachandran, A. Manuel Stephan**,** Organic free low temperature direct synthesis of hierarchical protonated layered titanates/anatase TiO_2 hollow spheres and their task- specific applications, **Journal of Materials Chemistry A 1(2013) 9122-9133**

15. A. Manuel Stephan, T.P.Kumar, M.A.K.Nathan, N.Angulakshmi Chitin-incorporated Poly(ethylene oxide)-based Nanocomposite electrolytes for lithium batteries, **Journal of Physical Chemistry B 113 (2009) 1963-1971**

16. V. Subramanian, A. Manuel Stephan, K.S. Nahm, S. Thomas, B.Wei**Journal of Physical Chemistry C 111 (2007) 7527-7538400 citations**

17. Y.J. Hwang, K.S. Nahm, T. Prem Kumar, A. Manuel StephanPoly(vinylidene fluoride-hexafluopropylene) based membranes for lithium batteries, **Journal of Membrane Science 310 (2008) 349**

18. C. H. Song, A. Manuel Stephan, Y. J. Hwang, AeRhan Kim, K.S. Nahm Influence of solvents on the structural and electrochemical properties of Li[Li0.2Ni0.1 Co0.2 Mn0.5]O2 prepared by semi-solid reaction method, **Journal of Electrochemical Society 153 (2006) A 390**

19. C.H. Song, Kee Suk Nahm, A. Manuel Stephan**,** The effect of compositional change of metals on the electrochemical behavior of layered $LiMO_2$ solid solutions **Journal of Power Sources 158 (2006) 620**

20. Y. Saito, H. Kataoka, A. Manuel Stephan, Investigation on the mechanisms of lithium gel polymer electrolytes based on electrical conductivity and diffusion co-efficient using NMR, **Macromolecules 34 (2001) 6955-6957**

Review articles

1. Review on gel polymer electrolytes for lithium batteries
   A. Manuel Stephan **European Polymer Journal** 21 (2006) 21-42 **1190 Citations**

2. Review on composite polymer electrolytes for lithium batteries
   A. Manuel Stephan, K. S. Nahm, **Polymer 47 (2006)5952-5964 800 citations**

3. Gel Electrolytes
   A. Manuel Stephan, S. Thomas
   Encyclopedia of Electrochemical Power Sources, Elsevier Publishers 2006 page 97-106

4. Understanding the electrolytes of lithium sulfur batteries,
   N. Angulakhsmi, R. Baby Dhanalakshmi, S. Sathy, A. Manuel Stephan,
   Materials Horizons(2020) Communicated

5. Conducting polymer based supercapacitors, S. Shruti, A. Nirmala Grace, A. Manuel Stephan,
   ACS Applied Polymer Materials (2020) Communicated

Google Scholar citations: 6097 h-index: 41