BRIEF VITAE of Dr. C. K. MAHADEVAN

(Along with Major Award Photographs)



1. Name and Address: **Dr. C. K. MAHADEVAN**
Professor of Physics (25-09-2014 to Date)
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2. Educational Qualifications: B.Sc. (Physics) (1978, from Madurai Kamaraj University)
M.Sc. (Physics) (1980, from Madras University)
Ph.D. (Physics) (1984, from IIT Madras)
D.Sc. (Physics) (2002, from Madurai Kamaraj University)

3. Positions Held Previously

(i) Junior Research Fellow, Senior Research Fellow and CSIR Research Associate in the Physics Department of IIT Madras, Chennai (1980-1985)

(ii) Lecturer in the Nuclear Physics Department of Madras University, Chennai (1985)

(iii) Postdoctoral Fellow in the Biochemistry Department of University of California, Riverside, USA (1985-1986)

(iv) CSIR Pool Officer in the School of Physics of Madurai Kamaraj University, Madurai (1987)

(v) Assistant Professor (Lecturer, Senior Lecturer & Reader) (24-08- 1987 to 26-07-2001) and **Associate Professor (27-07-2001 to 31-01-2014)** in the Physics Department of **S. T. Hindu College**, Nagercoil [Also, Coordinator for Science Research]

(vi) **Visiting Professor** in the Photoelectric Functional Materials Engineering Research Center of the Ministry of Education at **Changchun University of Science and Technology**, Changchun, China **(25-09-2017 to 18-10-2017)**

4. Teaching Experience

About 31 years at PG level. Taught B.Sc., M.Sc., M.Phil. and Ph.D. Physics students and also Physics for Chemistry and Mathematics major students.

5. Research Experience

About 32 years at Postdoctoral level. Completed guiding 2 Postdoctoral Research Associates, several B.Sc. and M.Sc. projects, 116 M.Phil. projects and (more than) 40 Ph.D.

projects. Major research field is *Solid State Materials- Preparation and Characterization of New and Hybrid (Doped/Mixed) Crystalline and Nanostructured Materials.*

Major contributions are:

Observed, for the first time, λλλ ring conformation in $[M(en)_3]^{2+}$ systems and mixed stacking and double stacking in some 1,2 – dithiolene complexes.

Systematically studied the nucleation kinetics of several inorganic and organic compound crystals and grouped the results into four rules.

Proposed two simple methods (seeded free evaporation and gel-solution) and succeeded in growing several large crystals.

Fabricated a low-cost sample holder for the electrical (both AC and DC) measurements and derived the required formula for determining the dielectric constant.

Discovered that conducting inorganic crystals can be grown by combining alkali and alkaline earth halides non- stoichiometrically.

Grown, for the first time, multi-phased ternary mixed crystals of alkali halides with abnormal dielectric properties.

Discovered that proper solid solutions can be prepared directly from the reactants taken at suitable proportions even if the end members have lattice mismatching.

Succeeded in growing quasi binary mixed crystals in the form of $Zn_xCd_{(2-x)}(SCN)_4$ with good size and quality and possessing useful optical and electrical properties.

Grown and characterized several organic and semi-organic NLO material crystals by modified Bridgman and solution methods.

Proposed a simple solvothermal method using domestic microwave oven and successfully prepared with reduced size, homogeneity and phase purity and characterized several important pure and doped II – VI compound and several other nanocrystals and all nanophases of Fe_2O_3 and NiS.

By using the above method, nanocomposites like $(ZnO)_x(CdO)_{1-x}$, $(ZnS)_x(ZnO)_{1-x}$, $(ZnS)_x(CdS)_{1-x}$, $(ZnO)_x(CdS)_{1-x}$, $(CdS)_x(CdSe)_{1-x}$, $(PbS)_x(PbO)_{1-x}$, $(Mn_3O_4)_x(Ni(OH)_2)_{1-x}$, $(CdS)_x(MnS_2)_{1-x}$, $(CdCO_3)_x(Mn_3O_4)_{1-x}$ and $(MnS_2)_x(Mn_3O_4)_{1-x}$ have also been prepared successfully with reduced size, homogeneity and phase purity and characterized.

Succeeded in forming high quality PVA polymer film sheets by a simple low-cost solution casting method and found that the use of different solvents leads the PVA film to possess different optical and electrical properties. Moreover, succeeded in preparing ZnO/CuO nanoparticles dispersed PVA polymer (nanocomposite) films.

Selected 20 Publications are:

A. In Crystal and Molecular Structure Analysis

1. Crystal and molecular structure of bis(tetrathiafulvalene) bis(maleonitrile-1, 2-dithiolato)nickelate (II) ***(Journal Impact Factor – 0.55)***
   C. Mahadevan
   Journal of Crystallographic and Spectroscopic Research (1986) **16**, 159-167
2. 1, 2 - Dithiolene complexes of transition metals – structural systematics and physical properties [***Review***] ***(Journal Impact Factor – 0.55)***
   C. Mahadevan
   Journal of Crystallographic and Spectroscopic Research (1986) **16**, 347-416

B. In Crystal Growth and Characterization

3. Dielectric parameters of KDP single crystals added with urea
   S. Goma, C. M. Padma and **C. K. Mahadevan**
   Materials Letters (2006) **60**, 3701-3705 ***(Journal Impact Factor – 2.57)***
4. Studies on $(NaCl)_x(KBr)_{y-x}(KI)_{1-y}$ solid solutions: 1. Lattice and thermal parameters
   G. Selvarajan and **C. K. Mahadevan**
   Journal of Materials Science (2006) **41**, 8211-8217 ***(Journal Impact Factor – 2.59)***

5. Studies on $(NaCl)_x(KBr)_{y-x}(KI)_{1-y}$ solid solutions: 2. Electrical measurements
G. Selvarajan and **C. K. Mahadevan**
Journal of Materials Science (2006) **41**, 8218-8225 ***(Journal Impact Factor – 2.59)***
6. Growth and dielectric properties of L-arginine acetate and L-arginine oxalate single crystals
M. Meena and **C. K. Mahadevan**
Materials Letters (2008) **62**, 3742-3744 ***(Journal Impact Factor – 2.57)***
7. Growth and characterization of benzyl single crystals using nano translation by modified vertical Bridgman technique ***(Journal Impact Factor – 3.47)***
T. Suthan, P. V. Dhanaraj, N. P. Rajesh, **C. K. Mahadevan** and G. Bhagavanarayana
CrystEngCommun (2011) **13**, 4018-4024
8. Growth and characterization of $Ni_xZn_{1-x}SO4.7H2O$ single crystals
J. M. Kavitha and **C. K. Mahadevan** ***(Journal Impact Factor - 2.54)***
Spectrochimica Acta: Part A (2014) **128**, 342-350
9. Growth, optical, thermal, mechanical and electrical properties of anhydrous sodium formate single crystals ***(Journal Impact Factor – 1.97)***
C. Amuthambigai, **C. K. Mahadevan** and X. Sahaya Shajan
Current Applied Physics (2016) **16,** 1030-1039
10. Large size crystal growth and structural, thermal, optical and electrical properties of $KCl_{1-x}Br_x$ mixed crystals ***(Journal Impact Factor – 1.75)***
Li Guo, Weizhao Jin, Zekun Chen, Jinghe Liu, Priya Murugasen, Fanming Zeng and **C. K. Mahadevan**
Journal of Crystal Growth (2017) **480**, 154-163
11. Growth and characterization of metal doped and quasi mixed crystals based on $ZnCd(SCN)_4$ ***(Journal Impact Factor – 1.75)***
C. Latha, **C. K. Mahadevan**, Li Guo and Jinghe Liu
Journal of Crystal Growth (2018) **(Accepted for publication)**

C. On Nanostructured Materials

12. Studies on synthesis and characterization of $Zn_{1-x}Cd_xS$ and $Zn_{1-x}Cd_xS:Mn^{2+}$ semiconductor quantum dots ***(Journal Impact Factor – 1.63)***
R. Sakthi Sudar Saravanan, D. Pukazhselvan and **C. K. Mahadevan**
Philosophical Magazine (2011) **91**, 389-403
13. Investigation on the synthesis and quantum confinement effects of pure and Mn^{2+} added $Zn_{(1-x)}Cd_xS$ nano crystals ***(Journal Impact Factor – 3.13)***
R. Sakthi Sudar Saravanan, D. Pukazhselvan and **C. K. Mahadevan**
Journal of Alloys and Compounds (2011) **509**, 4065-4072
14. Studies on the synthesis of cubic ZnS quantum dots, capping and optical-electrical characteristics ***(Journal Impact Factor – 3.13)***
R. Sakthi Sudar Saravanan, D. Pukazhselvan and **C. K. Mahadevan**
Journal of Alloys and Compounds (2012) **517**, 139-148
15. Photoluminescence and electrical impedance measurements on alloyed $Zn_{1-x}Cd_xS$ nanocrystals ***(Journal Impact Factor – 3.13)***
R. Sakthi Sudar Saravanan, and **C. K. Mahadevan**
Journal of Alloys and Compounds (2012) **541**, 115-124
16. Preparation by a simple route and characterization of amorphous and crystalline Fe_2O_3 nanophases ***(Journal Impact Factor – 2.57)***
S. I. Srikrishna Ramya and **C. K. Mahadevan**
Materials Letters (2012) **89**, 111-114
17. Preparation by a facile method and characterization of amorphous and crystalline nickel sulfide nanophases ***(Journal Impact Factor – 3.13)***

S. Nagaveena and **C.K. Mahadevan**
Journal of Alloys and Compounds (2014) **582**,447-456

18. Preparation and structural, optical, magnetic, and electrical characterization of $Mn^{2+}/Co^{2+}/Cu^{2+}$ doped hematite nanocrystals ***(Journal Impact Factor – 2.30)***
S. I. Srikrishna Ramya and **C. K. Mahadevan**
Journal of Solid State Chemistry (2014) 211, 37-50

19. Structural, optical and electrical characterization of Mn^{2+} and Cd^{2+} doped and co-doped PbS nanocrystals ***(Journal Impact Factor – 3.13)***
R. Sakthi Sudar Saravanan, M. Meena, D. Pukazhselvan and **C.K. Mahadevan**
Journal of Alloys and Compounds (2015) **627**, 69-77

20. Synthesis at room temperature and characterization of pure and Mn^{2+} doped CuS nanocrystals ***(Journal Impact Factor - 3.13)***
M. Annie Freeda and **C. K. Mahadevan**
Journal of Alloys and Compounds (2017) **726**, 1-10

6. Number of Publications

(i) In International journals: 1 *Research Review Article* and 222 *Research Papers*
(ii) In other journals and proceedings: 138 *Papers*
(iii) Books: 1 *Book Chapter*, 4 *Text Books* and 7 *Other Books*
(iv) Presentations in Conferences: 662 (including 72 *Invited/Keynote* Talks)

7. Funded Projects Availed

4 *Minor Research Projects* and 6 *Major Research Projects* from UGC, CSIR, TNSCST, DST and DRDO;

8. Conferences Organized

6 *Regional*, 1 *State level* and 4 *National* Conferences

9. Awards Received

From the Tamil Nadu State Government,
(i) *Best Book Authorship Award* (1995)
(ii) *Best Teacher Award* (2008-2009)
(iii) *Best Scientist Award* (TANSA) (2008)
From UGC, *Research Award* (2006)
From IACG, *Prof. P. Ramasamy National Award* for Crystal Growth (2006)
From KAAS, *Academic Achievement Award* (2010)
From SAA, *Lifetime Achiever's Award* (2012)
20 *Best Paper Presentation Awards* (through Ph.D. Scholars) and few other *Awards*

10. Honours and Recognitions

(i) Life Member of The National Academy of Sciences, India
(ii) Fellow of The Academy of Sciences, Chennai
(iii) Chaired sessions in 52 national/international conferences
(iv) Reviewed papers for 34 international journals and also reviewed 2 books
(v) Served in several academic and research related Committees and Boards
(vi) Selected as one of the Eminent Personalities of India by the International Biographical Research Foundation, India
(vii) Life Fellow of ICS, OSI and SAEST
(viii) Life member of IAPT, IACG, IPS, MRSI, SESI, KAAS, ISCA, IPA
(ix) Council Member (1993-96) and Vice President (2005-6) of Indian Physical Society
(x) Founder Vice President, Conference Organizing Committee Member and Editorial Board Member of the Kanyakumari Academy of Arts and Sciences (1996-Date)
(xi) Member of the American Physical Society (1990-1997)
(xii) Member of the Materials Research Society of Singapore (2011-2013)
(xiii) Delivered several lectures in the Refresher courses conducted by the Anna University,

University of Kerala and Pondicherry (Central) University and in the neighboring institutions to encourage research activity by the young teachers of colleges and universities

11. Special Contributions to S. T. Hindu College

(i) Succeeded in developing the Physics Department of S. T. Hindu College as a recognized Research Centre

(ii) Succeeded in bringing to the College the UGC's Innovative Program (M.Sc. Nanoscience and Nanotechnology)

(iii) Played a major role in getting to the Physics Department the PG Development Grant of UGC during the VIII, IX, X and XI Five Year Plan periods

(iv) Played a major role in getting the FIST-DST grant to the College

(v) Made major contributions for the Physics Department to get the appreciation as 'The Best Department in the College' by the NAAC Peer Review Committee during both the visits in the past

12. Languages Known

Tamil (Mother tongue) and **English** (To read, write, speak and comprehend well)
Hindi (To read and write) and **Malayalam** (To speak)

13. Countries Visited

(i) **USA** – Spent 1 year at University of California, Riverside, USA

(ii) **Singapore –** Spent 6 days at National University of Singapore, Singapore

(iii) **China** – Spent 24 days at Changchun University of Science and Technology, China

14. Major Award Photographs



Dr. C. K. Mahadevan receiving the Tamil Nadu State Government Award (year 1995) for the book 'Vignana Varalaru' in January 1997



Dr. C. K. Mahadevan receiving the D.Sc. degree in Physics (2002) from Madurai Kamaraj University



Dr. C. K. Mahadevan receiving the Prof. P. Ramasamy National Award for Crystal Growth (for the year 2006) in December 2006



Dr. C. K. Mahadevan receiving the Academic Achievement Award in the Sixth All India Conference of the Kanyakumari Academy of Arts and Sciences (2010)



Dr. C. K. Mahadevan receiving the Tamil Nadu Scientist Award (2008) and the Best Teacher Award (2008-2009) from the Tamil Nadu State Government



Dr. C. K. Mahadevan receiving the Life-Time Achiever Award (2012) from Scott Alumni Association