



Dr. Sam Solomon

Associate Professor / Research Guide

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PERSONAL INFORMATION

Residential address: Kolath, Puliyoor Gardens
Nalanchira P O, Trivandrum
Kerala, INDIA.

Date of birth: 31 May 1969

Nationality: Indian

EDUCATION

PhD - Microwave Materials

University of Kerala, 2000
Under the guidance of
Dr. M. T. Sebastian, Deputy Director
Materials and Minerals Division, NIIST (CSIR),
Thiruvananthapuram, Kerala, India.

MSc – Physics

Specialization: Electronics
University of Kerala, 1991

BSc – Physics

University of Kerala, 1989

FIELDS OF INTEREST

Synthesis of micro and nano scale poly crystals

Characterization using XRD, Vibrational spectroscopy
SEM and TEM

Microwave characterization using network analyzer

Optical characterization using Spectrophotometer

Fabrication of circuit elements such as filters and
oscillators using dielectric resonators

EXPERIENCE

Research: 18 years in fabrication and
characterization of electronic materials.

Teaching: 17 years in post graduate and under
graduate levels (Physics and Electronics).

AWARDS AND HONORS

- ❖ National Eligibility Test for Lectureship-UGC-India
- ❖ Junior Research Fellowship (JRF)- CSIR- India
- ❖ Selected by the University of Kerala for the Commonwealth Fellowship in 2005
- ❖ Dr. S. Vasudev award for the best major research project from Science and Technology, Govt. of Kerala in 2008
- ❖ Post doctoral research award –UGC- India (2009)
- ❖ Nominated as a member of the selection committee, NIIST (CSIR) (2010)

❖ Referee for the following journals

Journal of Alloys and compounds

Journal of Materials Science

Journal of Materials: Materials in Electronics

Materials Science and Engineering B

Solid State Sciences

PUBLICATIONS

- **42** papers in International Journals
- **15** seminar presentations

Ph.D. STUDENTS

Dr. Padmakumar. H. (awarded)

James T Joseph

Shyla Joseph

Suresh M.K.

Dhwajam D.B.

List of Publications

- 1) Dielectric properties of Ba₅Nb₄O₁₅ Ceramics, H. Sreemoolanathan, J. Issac, **Sam Solomon**, M.T.Sebastian, K.A.Jose and P.Mohanan, Physica Status Solidi (a) 143 (1), 1994, K45
- 2) Microwave dielectric resonators based on Ba((Bi_{0.2}D³⁺_{0.3})Nb_{0.5})O₃, (D³⁺ = Y, Pr, Sm, Gd, Dy, Er), **Sam Solomon**, H.Sreemoolanathan, M.T. Sebastian and P.Mohanan, Mater. Lett.28, (1996), 107.

- 3) Samarium Titanium Niobate(SmTiNbO_6) – a new microwave dielectric ceramic, M.T.Sebastian, R. Ratheesh, H.Sreemoolanathan, **Sam Solomon**, and P. Mohanan, *Mater.res.Bull*, 32(9),(1997), 1279
- 4) Tailoring the microwave dielectric properties of $\text{BaRE}_2\text{Ti}_4\text{O}_{12}$ and $\text{BaRE}_2\text{Ti}_5\text{O}_{14}$ ceramics by compositional variations. **S. Solomon**, N.Santha, I.N.Jawahar, H.Sreemoolanathan, M.T.Sebastian and P.Mohanan. *J. of Mater. Sci: Materials in Electronics* 11(2000) 595-602.
- 5) Synthesis, Characterization and properties of $[\text{RE}_{1-x}\text{RE}'_x]\text{TiNbO}_6$ dielectric ceramics. **Sam Solomon**, Manoj Kumar, K.P.Surendran, P.Mohanan and M.T.Sebastian. *Materials Chemistry and Physics* 67(2001)291-293.
- 6) Preparation, characterization and microwave properties of RETiNbO_6 (RE = Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Y and Yb) dielectric ceramics. M.T.Sebastian, **Sam Solomon**, R.Ratheesh, Jacob George and P.Mohanan, *J.Am. Ceram. Soc.*, 84[7]1487-89(2001)
- 7) Microwave dielectric properties of RETiTaO_6 (RE = La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Y, Er, Yb, Al & In) ceramics. K.P.Surendran, **Sam Solomon**, Manoj Raamavarma, P.Mohanan and M.T.Sebastian. *J.Mater. res.vol.17 No.10*, 2002.
- 8) A new group of microwave dielectric ceramics in $\text{RE}(\text{Ti}_{0.5}\text{W}_{0.5})\text{O}_4$ [RE = Pr, Nd, Sm, Gd, Tb, Dy & Y] system. P.V.Bijumon, **S.Solomon**, M.T.Sebastian, P.Mohanan. *J. of Mater. Sci: Materials in Electronics* 14 (2003) 5-8.
- 9) Effect of ZnO doping on the microwave dielectric properties of LnTiNbO_6 (Ln=Sm or Dy) ceramics, **Sam Solomon**, James T. Joseph a, H. Padma Kumar, Jijimon K. Thomas, *Materials Letters* 60 (2006) 2814-2818
- 10) Synthesis of strontium zirconate as nanocrystals through a single step combustion process, J.K. Thomas, H. Padma Kumar, R. Pazhani, **S. Solomon**, R. Jose, and J. Koshy, *Materials Letters* 61 (2006) 1592-1595
- 11) Photoluminescence and dielectric properties of LnTiTaO_6 (Ln = Ce, Pr, Sm) polycrystals, Lovely Jacob, H. Padma Kumar, K.G. Gopchandran, J. K. Thomas, **Sam Solomon**, *Journal of Materials Science: Materials in Electronics* 18 (2007) 831-835

- 12) Synthesis and characterization of Ba₂SmSbO₆ nanoparticles, C. Vijayakumar, H. Padma Kumar, **Sam Solomon**, Jijimon .K. Thomas, S.U.K. Nair, P.R.S. Wariar, J.Koshy, Modern Physics Letters B 21 (2007) 1-8
- 13) Synthesis and characterization of thermally stable, high Q , Nd_xY_{1-x}TiTaO₆ dielectric resonators, H. Padma Kumar, J.K. Thomas, M.R. Varma, **Sam Solomon**, Journal of Alloys and Compounds, 455 (2008) 475-479
- 14) Characterization and sintering of BaZrO₃ nanoparticles synthesized through a single-step combustion process, H. Padma Kumar, C. Vijayakumar, Chandy N. George, **Sam Solomon**, R. Jose, J.K. Thomas, J. Koshy, Journal of Alloys and Compounds, 458 (2008) 528-531
- 15) Nano particles of SmBa₂HfO_{5.5} through a single step auto-igniting combustion technique and their characterization, J. K. Thomas, H. Padma Kumar, **S. Solomon**, Chandy N. George, K. Joy, and J. Koshy, Physica Status Solidi (a), 204 (9) (2007) 3102-3107
- 16) Influence of zinc oxide addition on LnTiTaO₆ (Ln = Pr, Sm and Dy) materials for dielectric resonators, H. Padma Kumar, James T. Joseph, J.K. Thomas, Manoj Raama Varma, Annamma John, **Sam Solomon**, Mater. Sci. Eng. B, 143 (2007) 51-54
- 17) Ln(Zr_{1/3}Ti_{2/3})TaO₆ (Ln = Ce, Pr, Nd and Eu) : A Novel group of microwave ceramics, **Sam Solomon**, H. Padma Kumar, Lovely Jacob, J.K. Thomas and Manoj Raama Varma, J. Alloys Compd. (2007), 461 (2008) 675-677
- 18) Effect of Nb₂O₅ addition on the dielectric characteristics of DyTiTaO₆ microwave ceramics, James T. Joseph, H. Padma Kumar, M. R. Varmac, J. K. Thomas, **Sam Solomon**, Mater. Lett. 62 (2008) 1064-1066
- 19) Composites and solid solutions of Pr-Y Titanium Tantalate microwave ceramics, H. Padma Kumar, James T. Joseph, J.K. Thomas, K. Joy, **Sam Solomon**, J Mater Sci: Mater Electron, DOI 10.1007/s10854-008-9763-5
- 20) Synthesis of low loss, thermally stable Ce_xY_{1-x}TiTaO₆ Microwave ceramics H. Padma Kumar, C. Vijayakumar, J.K. Thomas, Manoj Raama Varma and **Sam Solomon**, Materials Research Bulletin 44 (2009) 276-279
- 21) Synthesis, characterization and microwave dielectric properties of CaZrO₃ nanoparticles, C.S. Prasanth, H. Padma Kumar, R. Pazhani, **Sam Solomon**, J.K. Thomas, Journal of Alloys and Compounds, 464 (2008) 306

- 22) Synthesis, structure analysis and microwave dielectric properties of $\text{LnTiSb}_x\text{Ta}_{1-x}\text{O}_6$ (Ln = Ce, Pr and Nd) ceramics, Hariharan Padma Kumar, Shyla Joseph, Jijimon Kumpukkatu Thomas, Manoj Raama Varma, **Sam Solomon**, International Journal of applied ceramic technology 5 (2008) 347
- 23) Effect of WO_3 and MoO_3 addition on LnTiTaO_6 (Ln = Ce, Pr and Nd) microwave ceramics, H. Padma Kumar, J.K. Thomas, Benny George and **Sam Solomon**, J. Alloys.Comd. doi: 10:1016/j/jalcom.2008.11.098
- 24) Synthesis, characterization, sintering and dielectric properties of nanostructured perovskite-type oxide $\text{Ba}_2\text{GdSbO}_6$, C. Vijayakumar, H. Padma Kumar, **Sam Solomon**, J.K. Thomas, P.R.S. Wariar, J. Koshy Bull.Mater. Sci., 31, 2008, 1–4
- 25) FT-Raman and FT-IR Vibrational spectroscopic studies of nanocrystalline $\text{Ba}_2\text{RESbO}_6$ (RE = Sm, Gd, Dy and Y) perovskites , C. Vijayakumar, H. Padma Kumar, **Sam Solomon**, J.K. Thomas, P.R.S. Wariar, Annamma John, J. Alloys Compd., Volume 480, Issue 2, 8 July 2009, Pages 167-170
- 26) Nano-crystalline $\text{GdBa}_2\text{HfO}_{5.5}$ perovskite dielectric material –A single step synthesis and its characterization, J.K Thomas, H Padma Kumar, Annamma John, V. Suni, K Joy, **S Solomon** and J Koshy, J. Phys. Chem. Solids. Doi: Journal of Physics and Chemistry of Solids 70,703-706(2009)
- 27) Synthesis and characterization of $\text{Ba}_2\text{DySbO}_6$ nanoparticles through a modified combustion process, C. Vijayakumar, H. Padma Kumar, V.T. Kavitha, **Sam Solomon**, J. K. Thomas, P.R.S. Wariar, J. Koshy, J. Alloys.Compd. Volume 475, Issues 1-2, 5 May 2009, Pages 778-781
- 28) Effect of Bi Substitution on LnTiTaO_6 (Ln = Ce, Pr and Nd) ceramics, H. Padma Kumar, Sumesh George, J.K. Thomas and **Sam Solomon**, J. Mater. Sci. Mater. Electron. J Mater Sci: Mater Electron (2010) 21:27–32.
- 29) Synthesis of nanocrystalline magnesium titanate by an auto-igniting combustion technique and its structural, spectroscopic and dielectric properties; M. K. Suresh, J. K. Thomas, H. Sreemoolanadhan, C. N. George, Annamma John, **Sam Solomon**, P. R. S. Wariar and J. Koshy Materials Research Bulletin (in press)
- 30) Microwave and photoluminescent characterizations of $(\text{Ca}_2\text{Mg}_3)(\text{X}_{1.75}\text{Sb}_{0.25})\text{TiO}_{12}$ [X = Nb and Ta] ceramics M. K. Suresh, P. R. S. Wariar, J. K. Thomas and **Sam Solomon**, J. Mater. Sci. Mater. (DOI: 10.1007/s10854-009-0045-7)

- 31) Synthesis, structural analysis and microwave dielectric properties of Bi and Pb substituted LnTiTaO_6 ($\text{Ln} = \text{Ce}, \text{Pr}$ and Nd) ceramics, **Sam Solomon**, H. Padma Kumar, Sumesh George and J.K. Thomas, *Journal of Materials Science: Materials in Electronics* Volume 21, 2010
- 32) Synthesis of nanocrystalline magnesium titanate by an auto-igniting combustion technique and its structural, spectroscopic and dielectric properties, M.K. Suresh , J.K. Thomas ,* H. Sreemoolanadhan, C.N. George , Annamma John, **Sam Solomon** P.R.S. Warier, J. Koshy , *Materials Research Bulletin* 45 (2010)
- 33) Photoluminescence and dielectric properties of Eu^{3+} substituted microwave ceramics. **Sam Solomon** , Lovely Jacob, H. Padma Kumar, K. G. Gopchandran and J. K. Thomas, *J. Mater. Sci. Mater.* 10.1007/s10854-009-0031-0
- 34) PbO doped Lanthanide Titanium Tantalate microwave ceramics, H. Padma Kumar, Annamma John, J.K. Thomas and **Sam Solomon**, *Bulletin of Material Science* (2010) (in press)
- 35) Fabrication and characterization of $x\text{PrTiTaO}_6$ $(1-x)$ YTiNbO_6 microwave ceramic composites. **Sam Solomon**, Dhvajam D.B, Remya G.R, Annamma John, Jijimon K Thomas, *Journal of Alloys and Compounds* 2010 (504) 151-154
- 36) Optical and dielectric properties of Lanthanide titanium tantalate and niobate ceramic composites, D.B. Dhvajam, J.K. Thomas, K. Joy, **Sam Solomon** *Journal of Materials Science: Materials in Electronics* DOI: 10.1007/s10854-010-0147-2 (2010)
- 37) Synthesis, Characterization, and Spectroscopic Analysis of $\text{Nd}_x\text{Y}_{1-x}\text{TiNbO}_6$ Microwave Ceramics, Shyla Joseph, M.K. Suresh, J.K. Thomas, Annamma John, **Sam Solomon**, *Int. J. Appl. Ceram. Technol.* Volume 7, 2010
- 38) Synthesis, Characterization and Properties of $\text{Ln}(\text{Ti}_{0.8}\text{Sn}_{0.2})\text{TaO}_6$ ($\text{Ln} = \text{Nd}, \text{Sm}$) microwave ceramics, **Sam Solomon**, *Journal of Alloys and Compounds* (2010) (in press)
- 39) Structural, spectroscopic and dielectric investigations on $\text{Ba}_8\text{Zn}(\text{Nb}_{6-x}\text{Sb}_x)\text{O}_{24}$ microwave ceramics, M.K. Suresh, Annamma John, J.K. Thomas, P.R.S. Warier, **Sam Solomon**, *Materials Research Bulletin* (2010) (in press)
- 40) Fabrication and Characterization of $\text{Ba}_8\text{Zn}(\text{Ta}_{6-x}\text{Sb}_x)\text{O}_{24}$ Microwave Ceramics **Sam Solomon**, Madukayil Kunjoonju Suresh, Annamma John, Jijimon Kumpukattu Thomas and Palakkattumala Ramachandra Sobhana Warier *International Journal of applied ceramic technology* (2010)

- 41) Structural analysis and properties of thermally stable $\text{Ba}_8\text{Mg}(\text{Nb}_{6-x}\text{Sb}_x)\text{O}_{24}$ microwave ceramics, M.K. Suresh, Annamma John, J.K. Thomas, P.R.S. Wariar, **Sam Solomon**, Journal of Alloys and Compounds (2010)
- 42) Synthesis and Characterization of Sn substituted LnTiNbO_6 (Ln=Nd, Sm and Y) microwave ceramics, **Sam Solomon**, International Journal of applied ceramic technology (2010)

SEMINAR PRESENTATIONS

- 1) Microwave dielectric resonators based on $\text{Ba}(\text{R}_{0.5-x}\text{Bi}_x\text{Nb}_{0.5})\text{O}_3$, **Sam Solomon**, H. Sreemoolanathan, J. Issac, M.T. Sebastian, A.D. Damodharan, K.A. Jose and P. Mohanan, 57th Annual session of the Indian Ceramic Society, New Delhi, (1994)
- 2) Dielectric resonators for microstrips circuits, H. Sreemoolanathan, **Sam Solomon**, J. Issac, M.T. Sebastian and P. Mohanan, Proc, 4th national Symposium on antennas and propagation (APSYM-CUSAT 94), pp146
- 3) Influence of Bismuth on the microwave dielectric properties of ceramic dielectric resonators, **Sam Solomon**, N. Santha, M.T. Sebastian, J. George and P. Mohanan, 10th National seminar on ferroelectrics and dielectrics, IIT Madras (1998)
- 4) Spectroscopic investigations on $\text{Ln}(\text{Zr}_{1/3}\text{Ti}_{2/3})\text{TaO}_6$ (Ln = Ce, Pr, Nd and Eu) ceramics, Annamma John, **Sam Solomon**, H. Padma Kumar, M.K. Suresh, C.S. Prasanth, A.S. Deepa and J.K. Thomas, presented in ICOPVS-2008(Department of Physics, Mar Ivanios College, Trivandrum)
- 5) Effect of ZnO addition on the microwave dielectric properties of CeTiTaO_6 dielectric resonators, H. Padma Kumar, Shyla Joseph, J.K. Thomas, M.R. Varma and **Sam Solomon**, presented in APSYM 2006 (Department of Electronics, CUSAT)
- 6) $\text{Sm}_{3/4}\text{Er}_{1/4}\text{TiNb}_x\text{Ta}_{1-x}\text{O}_6$ – Electronic materials for microwave communication, H. Padma Kumar, Annamma John, Lovely Jacob, J. K. Thomas, Manoj Raama Varma and **Sam Solomon**, presented in NCOL 2007 (Department of Opto electronics, University of Kerala)
- 7) Microwave Dielectric properties of Nano Crystalline BaZrO_3 and SrZrO_3 , H. Padma Kumar, C.S. Prasanth, A.S. Deepa, R. Pazhani, J.K. Thomas, **Sam Solomon**, presented in NCOP-2007, Department of Physics, St. Aloysius College, Edathua

- 8) Photoluminescent properties of LnTiNbO_6 (Ln = Ce, Nd, Y) polycrystals, Lovely Jacob, H. Padma Kumar, K.G. Gopachandran, J.K. Thomas and **Sam Solomon**, presented in NCOP-2007, Department of Physics, St. Aloysius College, Edathua.
- 9) Influence of WO_3 addition on LnTiTaO_6 (Ln = Ce, Pr and Nd) microwave ceramics, H. Padma Kumar, C.S. Prasanth, J.K. Thomas, **Sam Solomon**, presented in NCADMT-2008 Department of Physics, Sree Venkateswara University, Thirupati
- 10) Photoluminescent studies of GdTiMO_6 (M = Ta, Nb) ceramics, Lovely Jacob, K.G. Gopachandran, J.K. Thomas and **Sam Solomon**, Presented in NCADMT-2008 Department of Physics, Sree Venkateswara University, Thirupati
- 11) Synthesis and characterization of $\text{Ln}_{2/3}\text{Y}_{1/3}\text{TiNbO}_6$ (Ln=Ce, Pr, Nd and Sm) microwave ceramics, Shyla Joseph, H. Padma Kumar, M.K. Suresh, Annamma John, J.K. Thomas, **Sam Solomon**, presented in 'International Conference on Functional Materials for Advanced Technology' (ICFMAT-2009) 29-30 January, 2009. Velammal Engineering College, Ambattur - Red Hills Road, Chennai - 600 066, India
- 12) Photoluminescent and Dielectric Properties of $\text{Ca}_{4.75}\text{A}_{0.25}\text{Nb}_2\text{TiO}_{12}$ (A=Mg, Zn & Pb) Ceramics, M.K. Suresh, H. Padma Kumar, Shyla Joseph, J.K. Thomas and **Sam Solomon**, presented in 'International Conference on Functional Materials for Advanced Technology' (ICFMAT-2009) 29-30 January, 2009 Velammal Engineering College, Ambattur - Red Hills Road, Chennai, India
- 13) Liquid phase sintering of LnTiTaO_6 (Ln = Ce, Pr and Nd) microwave ceramics, H. Padma Kumar, M.K. Suresh, Shyla Joseph, J.K. Thomas, and **Sam Solomon**, presented in 'International Conference on Functional Materials for Advanced Technology' (ICFMAT-2009) 29-30 January, 2009 Velammal Engineering College, Ambattur - Red Hills Road, Chennai, India
- 14) Structural analysis and microwave dielectric properties of $\text{Ln}_{2/3}\text{Gd}_{1/3}\text{TiNbO}_6$ (Ln=Ce, Pr, Nd and Sm) ceramics, Shyla Joseph, Annamma John and **Sam Solomon**, presented in 'Kerala Science Congress-2009', Kollam, Kerala.
- 15) Synthesis and characterization of $x\text{PrTiTaO}_6(1-x)\text{YTiNbO}_6$ microwave ceramic composites, Dhvajam.d.b, Remya.g.r, **Sam Solomon**, Jijimon.K.Thomas; presented in 'Kerala Science Congress-2010', Peechi, Kerala.