Curriculum vitae

DR. ANIL KUMAR C

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EDUCATION

- **Ph.D.** (2012- 2017) Physics from Indian Institute of Technology Guwahati, India. Thesis submitted and Graduation Date: **2017-06-23.**
- **M.Tech.** (2012) Advanced Materials Science and Technology, National Institute of Technology Durgapur, India with 84% of marks.
- **M.Sc.** (2007) Physics (**Specialization:** Electronics and Instrumentation), Osmaniya University, Andhra Pradesh, India with 66% of marks.
- **B. Sc.** (2005) M.P.Cs. (Maths, Physics, Computers) from Kakatiya University, Andhra Pradesh, India with 66% of Marks.

Ph.D. THESIS

THESIS TITLE: **"Dielectric studies on $Ba_5Nb_4O_{15}$–$BaWO_4$ bulk and thin films"**

SUPERVISOR: Dr. Pamu D, Indian Institute of Technology Guwahati, Guwahati.

ACHIEVEMENTS

- Qualified Graduate Aptitude Test in Engineering (GATE) held on February, 2010.

RESEARCH EXPERIENCE

- **2014-2017**: **Senior Research Fellow** at the Department of Physics, Indian Institute of Technology Guwahati, India.

- **2012-14**: **Junior Research Fellow** at the Department of Physics, Indian Institute of Technology Guwahati, India.

RESEARCH AND INSTRUMENTAL SKILLS

- Expertise in preparation of dielectric oxide materials with Mechanical alloying, solid state reaction, and sol-gel process and deposition of thin films by using RF magnetron sputtering and pulsed laser deposition.
- Good knowledge in the characterizations like TGA, DSC, UV-VIS-NIR spectrophotometer, PL, XRD, AFM, FESEM, TEM, RF Impedance material analyzer, Vector network analyzer, LCR meter, Split Post Dielectric Resonators.
- Expertise in various physics related and other computational software viz. Full Prof Software, Zsimp Win (Impedance spectroscopy), WSXM 5.0 (AFM analysis), Origin 8.5 Pro, Adob Illustrator and familiar with C and C++ programming.
- Operated High energy ball milling, High temperature sintering Furnace.
- Operated X-ray diffractometer (M/s Rigaku, TTRAX III 18 kW) instrument.
- Operated scanning electron microscope SEM (M/s LEO, 1430vp) equipped with energy dispersive spectroscopy (EDS).
- Operated UV-VIS-NIR spectrophotometer (M/s Shimadzu, UV 3101PC).
- Operated Wayne kerr Electronics LCR meter (M/s Wayne Kerr Electronics Pvt. Ltd, 1J43100).
- Operated Agilent RF impedance and material analyzer (M/s Agilent Technologies, E4991A and M/s Novocontrol, Concept 70).
- Operated vector network analyzer (VNA, Rohde & Schwarz, Model no: ZVA24) by employing the QWED Krupka resonator cavity.

MAIN SKILLS

TEACHING EXPERIENCES

- **07/05/2018 - Till date: Assistant Professor** in Dept. of Physics in K L University, Vaddeswaram, Guntur, Andhra Pradesh, India.
- **Since 2007 - 2009: Faculty** in Physics in Govt. Girraj Degree and PG College, Nizamabad, Andhra Pradesh, India.
- **Since 2013 - 2015: Teaching Assistantship** for B. Tech at IIT Guwahati, India.

LANGUAGES

- **ENGLISH:** Very good level of spoken and written
- **HINDI:** Very good level of spoken and written
- **TELUGU:** Native (fluent)

INTERNATIONAL PUBLICATIONS

[1] **C. Anil Kumar, D. Pamu,** Dielectric, Optical and Electric Studies on Nanocrystalline $Ba_5Nb_4O_{15}$ Thin Films Deposited by RF Magnetron Sputtering, **Appl. Surf. Sci.** 340 (2015) 56.

[2] **C. Anil Kumar,** T. Santhosh Kumar, and **D. Pamu,** Irreversible thermochromic response of RF sputtered nanocrystalline $BaWO_4$ films for smart window applications, **AIP Advances** 5 (2015) 107232.

[3] **C. Anil Kumar, D. Pamu,** Dielectric and Electrical Properties of $BaWO_4$ Film Capacitors Deposited by RF Magnetron Sputtering, **Ceram. Int**. 41 (2015) S296.

[4] **Chikkala Anil Kumar** and **Dobbidi Pamu**, Sylvester Josephine, Impedance Spectroscopy, Broadband, and Microwave Dielectric Properties of Mechanically Alloyed $Ba_5Nb_4O_{15}$ Ceramics, **Int. J. Appl. Ceram.Technol.,** 13 (2016) 554.

[5] **C. Anil Kumar and D. Pamu,** Dielectric and Optical Characterization of RF Sputtered $Ba_5Nb_4O_{15}$–$BaWO_4$ Composite Films for Electronic and Smart Window Applications**, J. Electron. Mater.** 45 (2016) 3101.

[6] **C. Anil Kumar and D. Pamu,** Broadband and Microwave Dielectric Studies on $Ba_5Nb_4O_{15}$ Ceramics Supplemented with its Nanoparticles for Cryogenic Electronic Applications**, J. Electron. Mater. 46 (2017)** 917. DOI: 10.1007/s11664-016-5004-5.

[7] **Chikkala Anil Kumar, Dobbidi Pamu**, Microwave dielectric properties of low temperature fired $Ba_5Nb_4O_{15}$–$BaWO_4$ ceramics supplemented with their own nanoparticles for LTCC applications, **Int. J. Appl. Ceram.Technol.,** 14 (2017) 191. DOI: 10.1111/ijac.12639.

[8] Apurba Das, **Anil Kumar Chikkala**, Gyan Prakash Bharti, Rasmi Ranjan Behera, Ravi Sankar Mamilla, Alika Khare, Pamu Dobbidi, Effect of thickness on optical and microwave dielectric properties of Hydroxyapatitefilms deposited by RF magnetron sputtering, **Journal of Alloys and Compounds** 739 (2018) 729-736

CONFERENCES/WORKSHOPS ATTENDED

1. Deposition and Characterization of RF Sputtered Nanocrystalline $Ba_5Nb_4O_{15}$ Thin Films for Wide Bandgap Applications, Anil Kumar C and Pamu D*, ***"International Conference on Advanced Nanomaterials and Nanotechnology"*** (ICANN-**2013).**
2. Dielectric and Electrical Properties of Nanocrystalline $Ba_5Nb_4O_{15}$ Thin Films Deposited by RF Magnetron Sputtering for Microwave Integrated Capacitor Applications, Anil Kumar C and Pamu D*, **"*International Conference on Nano Science & Engineering Applications*" (ICONSEA-2014).**
3. Effect of V_2O_5 on $BaWO_4$ thin films deposited by RF sputtering for microwave decorative and dielectric capacitor applications, Anil Kumar C and Pamu D*, ***"Interantional conference on***

Technologically Advanced Materials and Asian Metting on Ferroelectricity" (ICTAM-AMF 10) November 7-11, 2016.

4. National Workshop on "Advanced Probing Techniques in TEM," Organized by Indian Institute of Technology Guwahati & Electron Microscopy Society of India Venue: Conference Center, IIT Guwahati Date: February 15 - 16, 2016.
5. National Workshop on "NEMS/MEMS and Theranostic Devices," 21st -22nd March 2016, at Centre for Excellence in Nanoelectronics &Theranostic Devices under the aegis of Centre for Nanotechnology at the Indian Institute of Technology Guwahati.

RESEARCH INTERESTS

- Experimental Condensed Matter Physics & Materials Science.
- Oxide thin films
- Microwave dielectric ceramics
- Nanotechnology
- Piezoelectrics
- Energy harvesting

RESEARCH SUMMARY

During my doctoral studies, dielectric resonators (DRs) of $Ba_5Nb_4O_{15}$ and $BaWO_4$ ceramics have been prepared using mechanical alloying method and semi - alkoxide precursor (sol - gel) method. The $Ba_5Nb_4O_{15}$ - $BaWO_4$ composite have been prepared in the bulk form using the conventional solid - state reaction method. The overall efforts in this study are to enhance the microwave dielectric properties of the bulk samples by improving the microstructure and relative density of this material prepared with the addition of their own nanoparticles prepared by sol - gel process. Successful efforts were made to reduce the sintering temperature without affecting the microwave dielectric properties of the $Ba_5Nb_4O_{15}$ and $Ba_5Nb_4O_{15}$ - $BaWO_4$ ceramics by supplementing with their own nanoparticles. Furthermore, it is proposed to compare the microwave properties of $Ba_5Nb_4O_{15}$ (BNO), $BaWO_4$ (BWO) and $Ba_5Nb_4O_{15}$ - $BaWO_4$ (BNO - BWO) in bulk and thin film forms. In addition, we have also investigated their optical and electrical properties, which could not only be useful in various applications but also helps in arriving at a comprehensive picture of the physics of these materials.

REFERENCES

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