BIO-DATA

Dr. PRASANTA KUMAR PANDA

Chief Scientist & Head, (Retd.)
Materials Science Division, CSIR-National Aerospace Laboratories, Bangalore

ADDRESS (Residence)
#79, 1st Floor, Prasanti, Near Bagmane Tech Park
CV Raman Nagar, Bangalore
Ph: +919448970424(M)
E-mail: pkpanda.nal@gmail.com

ACADEMIC QUALIFICATION

1. Ph.D (Materials Science), INSA de Lyon, France - 1999.
2. PGDBA – Finance Management, SCDL, Pune -2012.
3. B.Sc.Tech. (Ceramics)./ Calcutta University - 1987

PROFESSIONAL EXPERIENCE

1. CSIR-National Aerospace Laboratories, Bangalore, Chief Scientist – Feb, 2012 – Apr. 2024
2. CSIR-National Aerospace Laboratories, Bangalore, Sr. Principal Scientist – Feb, 2007 – Feb, 2012
3. CSIR-National Aerospace Laboratories, Bangalore, Principal Scientist – Feb, 2002 – Feb, 2007.
4. CSIR-National Aerospace Laboratories, Bangalore, Sr.Scientist – Feb, 1998 – Feb, 2002.
5. CSIR-National Aerospace Laboratories, Bangalore, Scientist – Feb, 1993 – Feb,1998.
6. DRDO-NCML, Bombay, Jr. Scientist – Aug,1989 – Feb,1993.
7. M/s Grindwell Norton Ltd, R&D Centre, Bangalore, Research Associate, Oct,1987-July 1989.

SPECIALIZATION AND EXPERTISE

Synthesis of advanced ceramics, Smart materials, Preparation of piezoelectric ceramics (PZT), Fabrications of Actuators and Sensors for aerospace vibration control, Energy Harvesting using Piezo materials, Preparation of advanced ceramics for high temperature applications, thermal shock and thermal fatigue study of ceramic materials, Radar Absorbing Materials (RAMs) for stealth application, Nanofibers for water filtration application.

SIGNIFICANT ACCOMPLISHMENTS

- Developed a novel process technology for preparation of **high purity alpha-alumina** widely used in ceramic industry. Appreciated and awarded as INAE young engineer award and as NAL young scientist of the year. Also appreciation by M/s. NALCO, Odisha (Patent filed).
- Developed a process for preparation of light-weight, porous **alumina tri hydrate (ATH)** for filler applications. [Patent filed and technology transferred to Industry **Mysore Minerals Products**].
- Established Electroceramics lab. at CSIR-NAL, Bangalore

- Transferred **PZT powder and products** technology to **M/s IPA Pvt. Ltd**, Bengaluru for commercial sale.
- Developed technology of PZT multi-layered stacks/actuators for aerospace vibration control and other applications.
- Developed Lead free piezo-ceramic and high temperature piezoresistive sensor materials
- Energy Harvesting using Piezo materials.
- Pilot-scale preparation of ceramic-oxide powders (PZT, PMN, Alumina, etc)
- Design and developed a new thermal shock and thermal fatigue test equipment for high temperature life prediction of ceramic / brittle materials.
- Developed a novel corrosion resistance silica coating on metals (Patent filed).
- Developed Polymer and Ceramic Nanofibers by electrospinning technique and their use for water filtration application.
- Developed Radar Absorbing Materials (RAM) for aircraft stealth application.

AWARDS AND DISTINCTIONS

1. **Prof Satish Dhawan Young Engineer Award**" (2013) from Karnataka State Council for Science and Technology (KSCST), Govt. of Karnataka. Presented by Sri Siddaramaiah, Chief Minister of Karnataka on 30th December 2015 at J. N. Tata Auditorium, IISc, Bangalore in the presence of Bharat Ratna Prof. C N R Rao and Prof. Anurag Kumar, Director, IISc.
2. **INAE Distinguished Visiting Professor**, RV College of Engineering, Bangalore.
3. **Shri Pavan Nagpal Memorial Award**-2013 by Indian Ceramic Society, Bangalore Chapter.
4. **Patent Innovation Award** (AMULYA-2012) from Karnataka State Innovation Council (KSIC).
5. **CSIR-DAAD fellowship** for the year 2012.
6. **C.V.Raman Fellowship** 2004 by CSIR, New Delhi at National University of Singapore (NUS) during Oct.04-to-Apr.05.
7. "**NAL Young Scientist of the Year**-1997".
8. "I**NAE-Young Engineer Award 1998**" presented by "Indian National Academy of Engineers" (INAE).
9. 1st prize for the poster presentation in International Conferences on Emerging Materials and Processes (ICEMP)-2014, held at CSIR-IMMT, Bhubaneswar during February, 26-28, 2014.
10. Best poster award at the 3rd India International Refractories Congress (IREFCON), Kolkata, 1998.

TECHNOLOGY TRANSFER

- Transferred **PZT powder and products** technology to **M/s IPA Pvt. Ltd**, Bengaluru for commercial sale.
- Developed a process for preparation of light-weight, porous **alumina tri hydrate (ATH)** for filler applications. [Patent filed and technology transferred to Industry **Mysore Minerals Products**].

PATENTS & PUBLICATIONS

- Patents:09, International & National Journals: 101, Book Chapters: 06
- Conference Papers: 68, Institutional Publications: 15, Invited Talks: 83, Newsletter / bulletin: 02
  https://scholar.google.com/citations?user=dDqTy2gAAAAJ&hl=en

THESIS SUPERVISED:

PhD:5 (Completed: 4, Thesis Submitted: 01), MTech-6, BE/B.Tech- 8

INTERNATIONAL COLLABORATION

- Laboratory of Oxide Materials, L.Ya. Karpov Institute of Physical Chemistry, Moscow, Russia on "Development of High Energy Density Piezoelectric Materials for Vibration Energy Harvesting" under DST-RFBF Program.
- Institute of Materials Science, University of Duisburg, Essen, Germany on "Vibration Energy Harvesting using Multi-Layered Piezoelectric Stacks / Devices: Comparative study on lead containing and lead free material systems" under CSIR-BMBF program (2015-17).
- Collaboration with NUS Singapore on development of ceramic nanofibers
- Participated in the joint research projects with INSA de Lyon, France funded by Indo-French Centre for Promotion of Advanced Research (IFCPAR), New Delhi.
- Collaborated with Mechanical Engineering Dept. INSA de Lyon (guided two students for their under graduate project work)
- Initiated collaboration with University of Darmstadt, Germany on fabrication of lead free piezo actuators.

NATIONAL COLLABORATION (INDUSTRIAL/ACADEMIC LIAISON)

- Collaboration with Defense Lab Jodhlur (DLJ) on development of nanofibers based membranes for water purification application (2015).
- Collaboration with NMRL, Mumbai, on fabrication of PZT, PMN-PT actuators for various aerospace and other applications.
- Collaboration with RWRDC, HAL, Bangalore on characterization of in-housed developed PZT devices for energy harvesting application.
- Worked with Department of Aerospace and Mechanical Engineering, IISc for the development of Micro Aerial Vehicles (MAVs)/Morphing technologies
- Development of special ring type of actuators for propellant flow control for ISRO (LEOS) (2009)
- Expertise rendered to BHEL, VSSC, DMRL, etc on characterization of thermal shock and thermal fatigue tests of ceramics.
- Obtained training from KEKO Equipments, Slovenia on fabrication of multilayered materials by tape casting.
- Technology transferred to M/s Mysore Mineral Products on the process for development of a high purity, low density alumina hydrate fillers for industrial applications. (1998)
- Technical collaboration/interaction with National Aluminium Company (NALCO) on the preparation of high purity alpha alumina by hydrothermal synthesis route (1997-1998)

CONFERENCES/SEMINARS ORGANIZED

- Organized a one-day seminar on "Piezo-ceramic Materials, Actuators and Sensors" at NAL, 21st June, 2008.
- Member Secretary, Conference Organizing Committee, ISSS International Conference on Smart Materials, Structures & Systems, 28-30, July, 2005
- Local Secretary, Materials Science Section, 90th Indian Science Congress Association (ISCA) at Bangalore, 2003.
- Member, Executive Council, Indian Ceramic Society, 2006-08

MEMBERSHIP OF PROFESSIONAL BODIES

- Life Member-Indian Ceramic Society,
- Life Member - Materials Research Society of India (MRSI),
- Life Member - Institute of Smart structures and systems (ISSS),

- Life Member - Indian Society for Advancement of Materials and Processing Engineering (ISAMPE).

PROJECTS EXECUTEATED: 16 Nos.

VISITS ABROAD: France, Germany, Slovenia, Singapore

CHAIRMAN / NATIONAL LEVEL COMMITTEES

- Chairman-CSIR-NAL Purchase committee
- Chairman, CSIR-NAL Academic committee
- Chairman, AcSIR, CSIR-NAL

SELECTED PUBLICATIONS

1. P.K.panda, Review: Environmental friendly lead-free piezoelectric materials, *Journal of Materials Sciences*, Vol.44, 2009, pp.5049-5062, (**Citations: 1160**).
2. P. K. Panda, B. Sahoo, PZT to Lead Free Piezo Ceramics: A Review, *Ferroelectrics*, 474 (2015) 128–143, (**Citations: 595**).
3. P.K.Panda, S. Ramakrishna, Electrospinning of alumina nanofibers, *J. Mater Sci*..42 (2007) 2189-2193, (**Citations: 163**).
4. Thermal shock and thermal fatigue of ceramic materials on a newly developed ascending thermal shock test equipment, P.K.Panda,T.S.Kannan, J.Dubois, C.Olagnon and G.Fantozzi, Science and Technology of Advanced Materials (STAM), Vol. 3, 2002, pp.327-334. (**Citations: 87**).
5. A Nag, RR Rao, PK Panda, High temperature ceramic radomes (HTCR)–A review, Ceramics International 47 (2021) 20793-20806. (**Citations: 84**).
6. PK Panda, Ceramic nanofibers by electrospinning technique-A review, Transactions of the Indian Ceramic Society 66 (2007) 65-76. (**Citations: 73**).
7. B Sowmya, A John, PK Panda, A review on metal-oxide based pn and nn heterostructured nano-materials for gas sensing applications, Sensors International 2 (2021) 100085. (**Citations: 70**).
8. B Sowmya, AB Hemavathi, PK Panda, Poly (ε-caprolactone)-based electrospun nano-featured substrate for tissue engineering applications: a review, Progress in biomaterials 10 (2021) 91-117. (**Citations: 66**).
9. B Sahoo, PK Panda, Preparation and characterization of barium titanate nanofibers by electrospinning, Ceramics International 38 (2012), 5189-5193. (**Citations: 66**).
10. Development of PZT powders by wet chemical method and fabrication of multilayered stacks/ actuators. B.Sahoo, V.A.Jaleel and P.K.Panda, *Mater Sci Engg.B*: 126 (2006) 80-85. (**Citations: 66**).
11. PK Panda, TS Kannan, J Dubois, C Olagnon, G Fantozzi, Thermal shock and thermal fatigue study of alumina, Journal of the European Ceramic Society 22 (2002) 2187-2196. (**Citations: 55**).
12. PK Panda, L Mariappan, TS Kannan, Carbothermal reduction of kaolinite under nitrogen atmosphere, Ceramics International 26 (2000) 455-461. (**Citations: 55**).
13. B Sahoo, PK Panda, Effect of lanthanum, neodymium on piezoelectric, dielectric and ferroelectric properties of PZT, Journal of Advanced Ceramics 2 (2013) 37-41. (**Citations: 50**).
14. PK Panda, VA Jaleel, S Usha Devi, Hydrothermal synthesis of boehmite and α-alumina from Bayer's alumina trihydrate, J. Mater Sci. 41 (2006) 8386-8389. (**Citations: 41**).
15. PK Panda, B Sahoo, TS Thejas, M Krishna, High d33 Lead-Free Piezoceramics: A Review, Journal of Electronic Materials, (2022) 1-15. (**Citations: 36**).