

RESUME

Name MURUGAN, KARUPPIAH **Age:** 41 **D.O.B:** 26/09/1977

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Academic Record

PhD, Department of Metallurgical and Materials Engineering 2012, IIT Madras, Chennai, India.

M.E, Industrial Metallurgy 2003, PSG College of technology, Coimbatore, India.

B.E Mechanical Engineering, 1999, National Engineering College, Tuticorin, India.

Career Record

June 2000-July 2001	Technical co-ordinator. Tekhtron India, Madurai 625011.
Aug 2001 – Feb 2003	M.E., Industrial Metallurgy Degree course PSG College of technology, Coimbatore 641004
Mar 2003 - Oct 2003	Junior Research Fellow PSG College of technology, Coimbatore 641004.
Oct 2003 – Sep 2007	Scientist “B” ARCI, Hyderabad 500005.
Oct 2007 – Sep 2012	Scientist “C” ARCI, Hyderabad 500005.
Oct 2012 – Sep 2017	Scientist “D” ARCI, Hyderabad 500005
Oct 2017 – till date	Scientist “E” ARCI, Hyderabad 500005

Details of Research and Work Experience

Tekhtron India, Madurai 625011, June 2000-July 2001

- Process design for manufacturing plastic moulds and press tools.
- Tool room machine maintenances.

PSG College of technology, Coimbatore 641004. Mar 2003 - Oct 2003

- Boronising surface modification process development.
- Multi component boronising process development.
- Boronising microstructure modification using LASER, Plasma and Induction heating.
- Boronising on extrusion and wire drawing dies.
- Design and fabrication of molten salt bath reactor for titanium coating on stainless steel.

Advanced Research Centre International, Hyderabad, 2003 – till date

- Developed a process for making nano silver powder and nano silver coated powder synthesise in lab scale and pilot scale level.
- Developed a process for making nano silver-coated ceramic drinking water filter for disinfect potable drinking water system.
- Process development of nano powder synthesis by microwave plasma.

- Nano powders of TiO₂, SiO₂, Al₂O₃, ZrO₂, Fe₂O₃, NiO, Ni and Si synthesised using microwave plasma.
- Developed a process for nano TiO₂ coating on ceramic floor and wall tiles for self-cleaning application.
- Developed a process for nano TiO₂ coating on glass windows for self-cleaning application.
- Design and methodology for selective solar coatings and ellipsometer data analysis
- Research and development of visible light induced self-cleaning coating.
- Development of anti-reflective coatings on borosilicate glass by sol-gel and chemical etching.
- Anti-tarnishing coating development for silver and copper alloys by sol-gel.
- Development of high temperature compliant glass seals for metal-ceramic bond.
- Design and fabrication of glass metal rigid bonded sealing machine.

Achievement

- Nano silver coated ceramic drinking water filters technology, successfully transfer to SBP technology, Hyderabad for commercialisation.
- Demonstrated the self-cleaning coatings technology on ceramic glazed wall tiles.
- Demonstration of anti- tarnishing on complex shape by sol-gel dip coating process.
- Demonstrated high temperature adhesive for metal ceramic seals in actual production line.

On-going activities

- Fabrication of semi-automated glass metal sealing (GMS) machine
- Development of pack aluminising process.

Patents filed

1. A process for the preparation of nano silver and nano silver coated ceramic powders by **K. Murugan**, T.N Rao filed as 2786/DEL/2005 dt 19/10/2005 (also filed in Indonesia, Srilanka, Bangladesh and South Africa).
2. An improved process for the preparation of nano silver-coated ceramic candle filters by J. Revathi, **K. Murugan**, T. N. Rao (1249/DEL/2011) dt 28/04/2011.
3. Indian patent application titled "An improved process to make coating compositions for transparent, UV blocking coatings on glass and a process of coating the same" by R. Subasri, Nabormi Mukhopadhyay and **K. Murugan**: filed as 1152/DEL/2014 dt 29-04-14.
4. Indian patent application entitled "An improved process for obtaining a transparent, protective coating on bi-aspheric / planoconvex lenses made of optical grade plastics for use in indirect ophthalmoscopy", invented by Raghavan Subasri, Sowntharya Logapperumal, **Karuppiah Murugan** filed as 3072/DEL/2013 on 17/10/13.
5. A method of preparation of anti-tarnishing organic-inorganic hybrid sol-gel and coating the same by **K.Murugan**, R. Subasri, G.Padmanabham: filed as 2049/DEL/2015 dt 7/7/2015.

Patents Granted

A process for the preparation of nano silver and nano silver coated ceramic powders by **K. Murugan**, T.N Rao Indian Patent No **284812**, Date of Grant: 20/03/2017.

Awards

- Platinum best group awards at the Asia Nanotech Camp 2011, August, 15-28. Seoul, South Korea, Title: Sustainable Nanotechnology for saving water.
- Best poster award in International conference and Exhibition on heat treatment and surface engineering 2013 titled on "Self cleaning function test on nano TiO₂ coated glasses and glazed ceramic tiles". May 16-18, 2013 Chennai Trade Centre, Chennai, India.

Sponsored Projects

S. N	Details of Research Projects	Funding Agency	Total cost	Role/Status	Outcome/Major Results/Highlights
1	Microwave plasma synthesis of nano-particle	HPCL	90,00,000.00	Co/PI Completed	<ol style="list-style-type: none"> 1. Acquired knowledge to indigenous the technology. 2. Three international publication. 3. Rs 80, 00,000.00 sanction from HPCL for new material development.
2	Development of anti-tarnishing coating technology	Titan (I) ltd	6,00,000.00	PI/ Completed	<ol style="list-style-type: none"> 1. Successfully demonstrated the technology to Titan (I) ltd, Hosur. 2. One Indian patent filed.
3	Development of anti-reflective coatings.	SERB	50,00,000.00	PI/ Completed	<ol style="list-style-type: none"> 1. Established AFM workstation. 2. Demonstrated AR coatings on 1-meter long tube.
4	Development of compliant glass sealants for high temperature application.	RCI	10,00,000	PI/ Completed	<ol style="list-style-type: none"> 1. Successfully demonstrated in RCI on 13/12/2018 2. Radiography pass 100%. 3. Thermal expansion and high temperature mechanical properties need to be evaluate.
Major consultancy work					
1	Development of interconnect material for solid oxide fuel cell	Ion America Chennai	20,00,000.00	Co-PI/ Completed	Literature Report with chemical/microstructural/ structural/ thermal characterization of given samples.
2	Supply of Anti-reflective coated glass tubes	Atria Power, Bangalore	7,00,000.00	PI/ Completed	Supply of 4 meter long AR coated borosilicate cover glass for solar thermal application.

Publications in International Journals

1. D. Sivaprahasam, S. B. Chandrasekhar, **K. Murugan**, K. V. P. Prabhakar (2019): Microstructure and mechanical properties of M62 high-speed steel powder consolidated by high-temperature gas extrusion, **Materials Research Innovations**, DOI: 10.1080/14328917.2019.1580889
2. S. Pendse, K.C.S. Reddy, C. Narendra, **K. Murugan**, S. Sakthivel. Dual-functional broadband antireflective and hydrophobic films for solar and optical applications. **Solar Energy** 163 (2018) 425-433.
3. A. Pareek, P. Paik, J. Joardar, **K. Murugan**, P. H. Borse. Fabrication of conducting polymer modified CdS photoanodes for photoelectrochemical cell. **Thin Solid Films** 661 (2018) 84–91.
4. M. Gririraj, **K. Murugan**., N. K. Sahu, K. Hembram. High performance multi-layer varistor (MLV) from doped ZnO nanopowders by water based tape casting: Rheology, sintering, microstructure and properties. **Ceramics International** 44 (2018) 7837–7843
5. I. Nagaraj, **K. Murugan**, N. Ramanuj, B. Pratyay, R. Kothapalli. TiO₂/poly (thiourethane-urethane)-urea Nanocomposites: Anticorrosion Material with NIR-Reflectivity and High Refractive Index. **Polymer** 119 (2017) 142-151.
6. **K. Murugan**, J. Joardar, A. S. Gandhi, B. S. Murty, P. H. Borse, Photo-induced monomer/dimer kinetics in methylene blue degradation over doped and phase controlled nano-TiO₂ films. **RSC. Adv.** 6, (2016) 43563-43573.
7. S. Pavithra, N. Rajender, M.V. Reddy, **K. Murugan**, K.I. Suresh. Effect of Graphene Oxide (GO) size and structure on synthesis and optoelectronic properties of hybrid GO-poly (3-Hexylthiophene) nanocomposites. **Ploym. Compos-** 2015. DOI 10.1002/pc.23646.
8. **K. Murugan**, R. Subasri, T. N. Rao, Ashutosh S. Gandhi, B.S. Murty. Synthesis, characterization and demonstration of self-cleaning TiO₂ coatings on glass and glazed ceramic tiles. **Prog. Org. Coat.** 76 (2013) 1756– 1760.
9. S. Mahendra kumar, **K. Murugan**, S.B. Chandrasekhar, Neha Hebalkar, M. Krishna, B.S. Satyanarayna, G. Madras, Synthesis and characterization of nano silicon and titanium nitride powders using atmospheric microwave plasma technique, **J. Chem. Sci.** 124 (2012) 557–563.
10. **K. Murugan**, S.B. Chandrasekhar, J. Joardar, Nanostructured α/β -tungsten by reduction of WO₃ under microwave plasma, **Int. Journal of Refractory Metals and Hard Materials** 29 (2011) 128–133.
11. **K. Murugan**, T. N. Rao, K. Radha, Hina Gokhale, Microwave Plasma Process Optimization to Produce Nano Titania through Design of Experiments, **Materials and Manufacturing Processes** 26 (2011) 1-10
12. **K. Murugan**, Tata N. Rao, G.V.N. Rao, A. S. Gandhi, B.S. Murty. Effect of dehydration rate on non-hydrolytic TiO₂ thin film processing: Structure, Optical and Photocatalytic Performance Studies. **Materials Chemistry and Physics** 129 (2011) 810-815.
13. V. Udhayabanu, K. R. Ravi, **K. Murugan**, D. Sivaprahasam and B.S. Murty, Development of Ni-Al₂O₃ *in-situ* Nanocomposite by Reactive Milling and Spark Plasma Sintering, **Metallurgical and materials transaction A** 42 A (7) (2011) 2085–2093.
14. **K. Murugan**, Tata N. Rao, Ashutosh S. Gandhi, B.S. Murty, Effect of aggregation of methylene blue dye on TiO₂ surface in self-cleaning studies. **Catalysis Communications** 11 (2010) 518–521.
15. R. Subasri, M. Tripathi, **K. Murugan**, J. Revathi, G.V.N. Rao, T.N. Rao, Investigations on the photocatalytic activity of sol–gel derived plain and Fe³⁺/Nb⁵⁺-doped titania coatings on glass substrates. **Materials Chemistry and Physics** 124 (2010) 63–68.
16. Revathi Janardhanan, **Murugan Karuppaiah**, Neha Hebalkar, Tata Narsinga Rao, Synthesis and surface chemistry of nano silver particles. **Polyhedron** 28 (2009) 2522–2530.

Publications in International Conferences/New letter

1. Titanium interdiffusion coating on austenitic stainless steel through molten salt electrolysis route for critical application in nuclear industries. P.Gopalakrishnan, U.Kamachimudali, P.sundarapandian, **K.Murugan**, K.Swaminathan, S.S.Ramakrishnan, H.S.Khatak, and Baldev Raj. ASTRA Nov 3-6 2003 P 694-699.
2. Surface hardening of Ti-6Al-4V alloy by boronising, K.Thillairajan, P. Sundarapandian, **K.Murugan**, P.Gopalakrishnan, P.C.Angelo, S.S..Ramakrishnan and P.Shankar. Advances in Materials & Processes for Industrial Applications & Materials Show 2003, Sep 25 – 27, Technical Volume, P69-73.
3. Modification of Boronised Case using Laser , Plasma and Induction Heating, M.sundar, K.Thillairajan, **K.Murugan**, P.Gopalakrishnan and S.S.Ramakrishnan, Power Beams and Material Processing 2002, P762-764.
4. **K Murugan**, R. Subasri. Current status of self-cleaning coatings. 15 (5) 2012 20-22.
5. T.N Rao, J. Revathi, **K. Murugan**, H. Neha, S. Ganesh. Nano silver for Anti-microbial Applications. 15 (4) 2012, 26-28.

Conferences and presentations

1. "Nano silver Impregnated ceramic drinking water filter" Poster presentation on ICONSAT2008 Feb 27 to 29, 2008. **K.Murugan**, J.Revathi, T.N. Rao and D.R.Prasada Raju
2. "Nano silver for antibacterial application", Poster Presentation on national conference on Powder metallurgy " Jan 23 & 24, 2006, Hyderabad.[J. Revathi, **K. Murugan**, T.N. Rao]
3. "Synthesis of nano silver from aqueous solution for anti-bacterial application" Poster presentation in Indo Singapore symposium on advanced functional material AFMS-2006, Feb. 24-26 IIT Bombay.[J. Revathi, **K. Murugan**, T.N. Rao]
4. "Nano silver for antibacterial application", Oral Presentation in NSTI 2007, Feb 22-24, 2007, ARCI Hyderabad. J. Revathi, **K. Murugan**, T.N. Rao].
5. "Microwave Plasma synthesis of Nano Powders" Poster presentation in NMD-ATM 2006 IIT Madras. [**K. Murugan**, *K. Radha, T.N. Rao and R. Sundaresan*]
6. "Nano-titania powder synthesis by microwave plasma process and the influence of process parameters on powder characteristics" Oral Presentation in International conference on Nano 2006, IISc Bangalore.[**K. Murugan**, *K. Radha, G.V.N Rao, T.N. Rao and R. Sundaresan*]

Declaration

I hereby declare that the entries in this resume are true to the best of my knowledge

Date: 16/05/2019

Signature: