Curriculam Vitae

Dr. Naresh Chandra Murmu

Senior Principal Scientist / Scientist -F
Head, Surface Engineering and Tribology Group
Head, Project Monitoring and Evaluation (PME) Group

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Educational Qualifications:

- **B.E.,** 1992, Mechanical Engineering, Calcutta University, Calcutta, India
- **M.E**., 1994, Mechanical Engineering, Indian Institute of Science, Bangalore, India
- **Ph.D**, 2010, Mechanical Engineering, Indian Institute of Technology (BHU), Varanasi, India

Professional Experience:

- ***Scientist***, CISR-Central Mechanical Engineering Research Institute, Durgapur
- (2003-till date)
- ***Visiting Scientist***, **Northwestern University, USA** (2011-12)
- ***Visiting Scientist*, University of Erlangen-Nuremberg, Germany (2001-03)**
- Scientist, **National Aerospace Laboratories**, Bangalore (1994-2003)

Awards and Distinctions:

- **VASVIK Award** (Mechanical & Strcutural Sciences & Technology) 2015
- **National Design Award** *(Mechanical Engineering)* NDRF (2012)
- **CSIR@70** Recognition for Developing Five Axis Micro Milling Machine (2012)
- **CSIR-Raman Research Fellowship** (2012)
- **DAAD fellowship -2001** (*German Academic Exchange Programme*).
- **Co-Author of MSEB Best Paper Award**, 2014 (Elsevier)

Editorship/Member:

- **Associate Editor**, Journal of the Institute of Engineers (India) Series –C
- **Co-Guest Editor**, *Sivan, K., &**Murmu, N. C.** (2017). Special Theme: India's Reusable Launch Vehicle Technology Demonstrator: The Future of Space Transportation System.*
- **Member**, BOCS, Indian Institute of Technology (ISM), Dhanbad.
- **Member**, Expert Advisory Committee-AMT, Department of Science & technology, New Delhi.
- **Member**, Lubricating Equipment Sectional Committee, PGD19, Bureau of Indian Standard, Govt. of India.

Key achievements as Team Leader:

- **5kW Micro Turbine** *(demostrated @40,000rpm)*
- **5 Axis Micro-Milling Machine** *(demonstrated milling 100µm feature).*
- **Graphene Super-Capacitor** *(~113W/Kg at device level).*
- **Foil Bearing** *(demonstrated at 30,000rpm)*
- **EHD-Ink Jet Printing**
- **Graphene Lubricant (cof ~0.01**) *for hot forging.*
- **Miniature Turbine (***demonstrated @2.73 Lakh rpm).*
- **Graphene Nano-composite** *(UTS ~46% improvement)*
- **Die Wear Monitoring System** *(successfully tested at TATA Steel, Jamshedpur).*

Peer-Reviewed Journals

1. Paul, G., Hirani, H., Kuila, T., & Murmu, N. C. (2019). Nanolubricants Dispersed with Graphene and its Derivatives: An Assessment and Review of the Tribological Performance. ***Nanoscale.*** (**I.F.- 7.233**) (*in press*)

2. Adak, N. C., Chhetri, S., Murmu, N. C., Samanta, P., Srivastav, S.,& T. Kuila (2019). Synergistic effect of Fe3O4 anchored N-doped rGO hybrid on mechanical, thermal and electromagnetic shielding properties of epoxy composites. ***Composites Part B: Engineering***, (**I.F.- 4.727**) (*in press*)

3. Murmu, M., Saha, S. K., Murmu, N. C., & Banerjee, P. (2019). Amine cured double Schiff base epoxy as efficient anticorrosive coating materials for protection of mild steel in 3.5% NaCl medium. ***Journal of Molecular Liquids.*** (**I.F.- 4.513**) (*in press*)

4. Paul, G., Shit, S., Hirani, H., Kuila, T., & Murmu, N. C. (2019). Tribological behavior of dodecylamine functionalized graphene nanosheets dispersed engine oil nanolubricants. ***Tribology International***, 131, 605-619(**I.F.- 3.246**).

5. Murmu, M., Saha, S. K., Murmu, N. C., & Banerjee, P. (2019). Effect of stereochemical conformation into the corrosion inhibitive behaviour of double azomethine based Schiff bases on mild steel surface in 1 mol L− 1 HCl medium: An experimental, density functional theory and molecular dynamics simulation study. ***Corrosion Science***, 146, 134-151(**I.F.- 4.862**).

6. Adak, N. C., Chhetri, S., Murmu, N. C., Samanta, P., Kuila, T., & Lee, J. H. (2019). Experimental and numerical investigation on the mechanical characteristics of polyethylenimine functionalized graphene oxide incorporated woven carbon fibre/epoxy composites. ***Composites Part B: Engineering***, 156, 240-251(**I.F.- 4.727**).

7. Sharath Kumar J, Ghosh S. , Murmu, N. C., Mandal, N., Kuila Tapas (2019), Electrochemical detection of H2O2 using copper oxide-reduced graphene oxide heterostructure, ***Journal of Nanoscience and Nanotechnology***, (**I.F.- 1.354**) (in press)

8. Saha, S., Jang, W., Murmu, N. C., Koo, H., & Kuila, T. (2019). Optimization of Chemi-adsorption, EDLC, and Redox Capacitance Through Electro-precipitation Synthesis of Fe3O4/NiO@ rGO/h-BN for the Development of Hybrid Supercapacitor. ***ChemistrySelect,*** 4(2), 589-599. (**I.F.- 1.505**)

9. Chhetri, S., Samanta, P., Murmu, N. C., & Kuila, T. (2019). Anticorrosion Properties of Epoxy Composite Coating Reinforced by Molybdate-Intercalated Functionalized Layered Double Hydroxide. ***Journal of Composites Science***, 3(1), 11. (**I.F.- Pending**)

10. Shit, S.; Chhetri, S.; Jang, W.; Murmu, N. C.; Koo, H.; Samanta, P.; ***Kuila, T***. (2018). Cobalt sulphide/nickel sulphide heterostructure directly grown on nickel foam: an efficient and durable electrocatalyst for overall water splitting application. ***ACS Applied Materials and Interface*****, 2018,** 10, 27712-27722. (**I.F.- 8.097**).

11. Chhetri, S.; Adak, N. C.; Samanta,P.; Murmu,N. C.; Kuila, T. (2018). Exploration of mechanical and thermal properties of the cetyltrimethylammonium bromide modified molybdenum disulfide (MoS_2)/Linear low density polyethylene composites prepared by melt mixing. ***Journal of Composite Sciences*****,** 2, 37**.** (**I.F.- Pending**).
12. Chhetri, S.; Adak, N. C.; Samanta, P.; Murmu, N. C.; Kuila, T. (2018). Rheological, mechanical, and thermal properties of silane grafted layered double hydroxide/epoxy composites. ***Industrial & Engineering Chemistry Research*****.** 57, 8729-8739**.** (**I.F.- 2.843**).

13. Adak, N. C.; Chhetri, S.; Kuila, T.; Murmu, N. C.; Samanta, P.; Lee J. H. (2018). Effect of hydrazine reduced graphene oxide on Inter-laminar Fracture Toughness of woven carbon fiber/epoxy composite. ***Composite Part B: Engineering*****,** 149, 22-30. (**I.F.- 4.727**).

14. Saha, S.; Kumar, J. S.; Murmu, N. C.; Samanta, P.; Kuila, T. (2018). Controlled electrodeposition of Iron oxide/Nickel oxide@Ni for the investigation of the effect of stoichiometry and particle size on energy storage and water splitting application. ***Journal of Materials Chemistry A*** 6, 9657-9664. (**I.F.- 9.931**).

15. Kumar, J. S.; Murmu, N. C.; Kuila, T. (2018). Recent trends in the graphene-based sensor for the detection of hydrogen peroxide. ***AIMS Material Science*****,** 5, 422-466**.** (**I.F.- Pending**).

16. Saha, S., Samanta, P., Murmu, N. C., & Kuila, T. (2018). A review on the heterostructure nanomaterials for supercapacitor application. ***Journal of Energy Storage***, 17, 181-202. **(I.F.- Pending)**

17. Chhetri, S., Adak, N. C., Samanta, P., Murmu, N. C., Hui, D., Kuila, T., & Lee, J. H. (2018). Investigation of the mechanical and thermal properties of l-glutathione modified graphene/epoxy composites. ***Composites Part B: Engineering***, 143, 105-112. **(I.F.- 4.727)**

18. Saha, S., Samanta, P., Murmu, N. C., Banerjee, A., Ganesh, R. S., Inokawa, H., & Kuila, T. (2018). Modified electrochemical charge storage properties of h-BN/rGO superlattice through the transition from n to p type semiconductor by fluorine doping. ***Chemical Engineering Journal***, 339, 334-345. **(I.F.- 6.735)**

19. Chhetri, S., Adak, N. C., Samanta, P., Mallisetty, P. K., Murmu, N. C., & Kuila, T. (2018). Interface engineering for the improvement of mechanical and thermal properties of covalent functionalized graphene/epoxy composites. ***Journal of Applied Polymer Science***, 135(15). **(I.F.- 1.9)**

20. Ghosh, P., Hazra, A., Ghosh, M., Murmu, N. C., & Banerjee, P. (2018). Halide salts and their structural properties in presence of secondary amine based molecule: A combined experimental and theoretical analysis. ***Journal of Molecular Structure***, 1157, 444-449. **(I.F.- 1.602)**

21. Adak, N. C., Chhetri, S., Kim, N. H., Murmu, N. C., Samanta, P., & Kuila, T. (2018). Static and Dynamic Mechanical Properties of Graphene Oxide-Incorporated Woven Carbon Fiber/Epoxy Composite. ***Journal of Materials Engineering and Performance,*** 27(3), 1138-1147. **(I.F.- 1.094)**

22. Saha, S. K., Murmu, M., Murmu, N. C., Obot, I. B., & Banerjee, P. (2018). Molecular level insights for the corrosion inhibition effectiveness of three amine derivatives on the carbon steel surface in the adverse medium: A combined density functional theory and molecular dynamics simulation study. ***Surfaces and Interfaces***, 10, 65-73. **(I.F.- 1.393)**

23. Adak, N. C., Chhetri, S., Murmu, N. C., Samanta, P., & Kuila, T. (2018). Effect of Thermally Reduced Graphene Oxide on Mechanical Properties of Woven Carbon Fiber/Epoxy Composite. ***Crystals,*** 8(3), 111. **(I.F.- 2.144)**

24. Kumar, J. S., Murmu, N. C., Samanta, P., Banerjee, A., Ganesh, R. S., Inokawa, H., & Kuila, T. (2018). Novel synthesis of a Cu 2 O–graphene nanoplatelet composite through a two-step electrodeposition method for selective detection of hydrogen peroxide. ***New Journal of Chemistry***, 42(5), 3574-3581. **(I.F.- 3.201)**

25. Chhetri, Suman, Nitai Chandra Adak, Pranab Samanta, Nilrudra Mandal, Tapas Kuila, and Naresh Chandra Murmu. "Investigation of mechanical and thermal properties of the cetyltrimethylammonium

bromide functionalized molybdenum disulfide (MoS 2)/epoxy composites." ***Polymer Bulletin*** 75, no. 1 (2018): 327-343. **(I.F.-1.589)**.

26. Ghosh, P.; Roy, P.; Ghosh, A.; Jana, S.; Murmu, N. C.; Mukhopadhyay, S. K. and Banerjee, P*. Explosive and pollutant TNP detection by structurally flexible SOFs: DFT-D3, TD-DFT study and in vitro recognition. ***Journal of Luminescence*****, 2017,** 185,272-278. **(I.F.-2.693)**.

27. Saha, S. K., Murmu, M., Murmu, N. C., Obot, I. B., & Banerjee, P. (2018). Molecular level insights for the corrosion inhibition effectiveness of three amine derivatives on the carbon steel surface in the adverse medium: A combined density functional theory and molecular dynamics simulation study. ***Surfaces and Interfaces***, 10, 65-73. (**I.F.- 1.393**)

28. Adak, N. C., Chhetri, S., Kim, N. H., Murmu, N. C., Samanta, P., & Kuila, T. (2018). Static and Dynamic Mechanical Properties of Graphene Oxide-Incorporated Woven Carbon Fiber/Epoxy Composite. ***Journal of Materials Engineering and Performance***, 27(3), 1138-1147. (**I.F.-1.094**).

29. Kumar, M. P., De, S., Samanta, P., & Murmu, N. C. (2018). A comprehensive numerical model for double-layered porous air journal bearing at higher bearing numbers. ***Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology***, 232(5), 592-606. (**I.F.-1.318**).

30. Saha, S.; Samanta, P.; Murmu, N. C.; Kuila, T. (2017) Investigation of surface plasmon polariton and electrochemical property of covalent and non-covalent functionalized reduced graphene oxide. ***Physical Chemistry Chemical Physics.*** 19, 28588 - 28595. (**I.F.-4.123**).

31. Jana, M.; Samanta, P.; Murmu, N. C.; Kuila, T.(2017) Surface modification of reduced graphene oxide through successive ionic layer adsorption and reaction method for redox dominant supercapacitor electrodes. ***Chemical Engineering Journal.*** 330, 914-925.(**I.F.-6.216**).

32. Chhetri, S.; Adak, N. C.; Samanta, P.S.; Murmu, N. C.; Kuila, T. (2017) Functionalized reduced graphene oxide/epoxy composites with enhanced mechanical properties and thermal stability. ***Polymer Testing*****,** 63, 1-11. (**I.F.-2.447**).

33. Jana, M.; Samanta, P.; Murmu, N. C.; Kuila, T. (2017) Morphology controlled synthesis of $MnCO_3$-RGO materials and their supercapacitor applications. ***Journal of Materials Chemistry A.*** 5, 12863-12872. (**I.F.-8.867**).

34. Chhetri, S.; Adak, N. C.; Samanta, P.; Mandal, N.; Kuila, T.; Murmu, N. C. (2017) Investigation of mechanical and thermal properties of the cetyltrimethylammonium bromide functionalized molybdenum disulfide (MoS_2)/epoxy composites. ***Polymer Bulletin*****.** (doi:10.1007/s00289-017-2037-8) (**I.F.-1.43**).

35. Saha, S., Samanta, P., Murmu, N. C., Kim, N. H., Kuila, T., & Lee, J. H. (2017). Electrochemical functionalization and in-situ deposition of the SAA@ rGO/h-BN@ Ni electrode for supercapacitor applications. ***Journal of Industrial and Engineering Chemistry***, 52, 321-330. (**I.F.-4.841**).

36. Saha, S.; Jana, M.; Samanta, P.; Murmu, N. C.; Kim, N. H.; Kuila, T, Lee, J. H. (2017) Investigation of band structure and electrochemical properties of h-BN/rGO composites for asymmetric supercapacitor applications. ***Materials Chemistry and Physics.*** 190, 153-165.(**I.F.-2.210**).

37. Jana, M.; Saha, S.; Samanta, P.; Murmu, N. C.; Kim, N. H.; Kuila, T, Lee, J. H. (2017) A successive ionic layer adsorption and reaction (SILAR) method to fabricate a layer-by-layer (LbL) MnO_2-reduced graphene oxide assembly for supercapacitor application. ***Journal of Power Sources.*** 340, 380-392. (**I.F.-6.395**).

38. Chhetri, S.; Samanta, P.; Murmu, N. C.; Srivastava, S. K.; Kuila, T. (2017) Electromagnetic interference shielding and thermal properties of non-covalently functionalized reduced graphene oxide/epoxy composites. ***AIMS Materials Science***, 4, 61-74.(**IF: Pending**)

39. Bandyopadhyay, P.; Kuila, T.; Balamurugan, J.; Nguyen, T. N.; Kim, N. H.; Lee, J. H. (2017) Facile synthesis of novel sulfonated polyaniline functionalized graphene using m-aminobenzene sulfonic acid for asymmetric supercapacitor application. ***Chemical Engineering Journal.*** 308, 1174-1184.(**I.F.-6.735**).

40. Jana, M.; Saha, S.; Samanta, P.; **Murmu, N. C**.; Kim, N. H.; Kuila, T, Lee, J. H. (2017) Investigation of band structure and electrochemical properties of h-BN/rGO composites for asymmetric supercapacitor applications. ***Materials Chemistry and Physics***. 190, 153-165. (**I.F.-2.201**).

41. Jana, M.; Saha, S.; Samanta, P.; **Murmu, N. C.;** Kim, N. H.; Kuila, T, Lee, J. H. (2017) A successive ionic layer adsorption and reaction (SILAR) method to fabricate a layer-by-layer (LbL) MnO_2-reduced graphene oxide assembly for supercapacitor application**.** ***Journal of Power Source.*** 340, 380-392. (**I.F.-6.33**).

42. Saha, S.; Jana, M.; Samanta, P.; **Murmu, N. C**.; Kuila,(2016) T. Efficient access of voltametric charge in hybrid supercapacitor configured with potassium incorporated nano-graphitic structure derived from cotton (Gossypium arboreum) as negative and $Ni(OH)_2$/rGO composite as positive electrode. ***Industrial & Engineering Chemistry Research.*** 55, 11074-11084 (**I.F.-2.56**).

43. Chhetri, S., Samanta, P., Murmu, N. C., Srivastava, S. K., & Kuila, T. (2016). Effect of Dodecyal Amine Functionalized Graphene on the Mechanical and Thermal Properties of Epoxy-Based Composites. ***Polymer Engineering & Science***, 56(11), 1221-1228. (**I.F.-1.551**).

44. Saha, S.; Chhetri, S.; Khanra, P.; Samanta, P.; Koo, H.; **Murmu, N. C.;** Kuila, T. (2016) *In-situ* hydrothermal synthesis of MnO_2/NiO@Ni hetero structure electrode for hydrogen evolution reaction and high energy asymmetric supercapacitor applications. ***Journal of Energy Storage.*** 6, 22-31. (**I.F.-Pending**).

45. Kumar, J. S.; Jana, M.; Khanra, P.; Samanta, P.; Koo, H.; **Murmu, N. C.;** Kuila, T.(2016) One pot synthesis of Cu_2O/RGO composite using mango bark extract and exploration of its electrochemical properties. ***Electrochimica Acta.*** 193, 104-115. (**I.F.-5.116**)

46. Jana, M.; Saha, S.; Samanta, P.; **Murmu, N. C**.; Kim, N. H.; Kuila, T, Lee, J. H. (2016) Growth of Ni-Co binary hydroxide on reduced graphene oxide surface by a successive ionic layer adsorption and reaction (SILAR) method for high performance asymmetric supercapacitor electrode. ***Journal of Materials Chemistry A***. 4, 2188-2197. (**I.F.-9.931**).

47. Saha, S.; Jana, M.; Khanra, P.; Samanta, P.; Koo, H.; **Murmu, N. C.;** Kuila, T.(2016) Band gap modified boron doped NiO/Fe_3O_4 nanostructure as the positive electrode for high energy asymmetric supercapacitor. ***RSC Advances***. 6, 1380-1387. (**I.F.-3.28**).

48. Jana, M.; Kumar, J. S.; Khanra, P.; Samanta, P.; Koo, H.; **Murmu, N. C**.; Kuila, T. (2016) Superior performance of asymmetric supercapacitor based on reduced graphene oxide-manganese carbonate as positive and sono-chemically reduced graphene oxide as negative electrode materials. ***Journal of Power Sources.*** 303, 222-233. (**I.F.-6.33**).

49. Ghosh, P., Roy, P., Ghosh, A., Jana, S., **Murmu, N. C.,** Mukhopadhyay, S. K., & Banerjee, P. (2017) Explosive and pollutant TNP detection by structurally flexible SOFs: DFT-D3, TD-DFT study and in vitro recognition. ***Journal of Luminescence***, 2017, *185*, 272-278 (**IF:1.6**).

50. Saha, S. K., Murmu, M., Murmu, N. C., & Banerjee, P.(2016) Evaluating electronic structure of quinazolinone and pyrimidinone molecules for its corrosion inhibition effectiveness on target specific mild steel in the acidic medium: A combined DFT and MD simulation study. ***Journal of Molecular Liquids.*** 224, 629-638 (**IF:4.513**).

51. Saha, S. K., Hens, A., **Murmu, N. C.**, & Banerjee, P.(2016) A comparative density functional theory and molecular dynamics simulation studies of the corrosion inhibitory action of two novel N-heterocyclic organic compounds along with a few others over steel surface. ***Journal of Molecular Liquids.***16, 215, 486-495(**IF:4.513**).

52. Chowdhury, A. R., Ghosh, P., Roy, B. G., Mukhopadhyay, S. K., **Murmu, N. C.,**& Banerjee, P. (2015) Cell permeable fluorescent colorimetric Schiff base chemoreceptor for detecting F− in aqueous solvent. ***Sensors and Actuators B: Chemical***, 2015,220, 347-355(**IF:5.667**).

53. Saha, S.; Jana, M.; Samanta, P.; **Murmu, N. C.;** Kuila, T. (2015) In situ preparation of SAC-RGO@Ni electrode by electrochemical functionalization of reduced graphene oxide using sulfanilic acid azocromotrop and its application in Asymmetric supercapacitor. ***Journal of Materials Chemistry A.*** 3, 19461-19468. (**I.F.-9.931**)

54. Saha, S.; Jana, M.; Khanra, P.; Samanta, P.; Koo, H.; **Murmu, N. C**.; Kuila, T. (2015) Band gap engineering of boron nitride by graphene and its application as positive electrode material in asymmetric supercapacitor device. ***ACS Applied Materials & Interfaces.*** 7, 14211-14222. (**I.F.-8.097**).

55. Jana, M.; Saha, S.; Khanra, P.; Samanta, P.; Koo, H.; **Murmu, N. C**.; Kuila, T. (2015) Non-covalent functionalization of reduced graphene oxide using sulfanilic acid azocromotrop and its application as supercapacitor electrode material. ***Journal of Materials Chemistry A***. 3, 7323-7331. (**I.F.-9.931**)

56. Jana, M.; Saha, S.;Samanta, P.; **Murmu, N. C**.; Kim, N. H.; Kuila, T.; Lee, J. H. (2015) Development of high energy density supercapacitor through hydrothermal synthesis of RGO/nano-structured cobalt sulphide composites. ***Nanotechnology***. 26, 075402 (**I.F.-3.404**).

57. Jana, M.; Saha, S.; Samanta, P.; **Murmu, N. C.;** Lee, J. H.; Kuila, T. (2015) Investigation of the capacitive performance of tobacco solution reduced graphene oxide. ***Materials Chemistry and Physics.*** 151, 72-80 (**I.F.-2.210**).

58. Saha, S.; Jana, M.; Samanta, P.; **Murmu, N. C.;** Kim, N. H.; Kuila, T.; Lee, J. H. (2014) Hydrothermal synthesis of Fe_3O_4/RGO composites and investigation of electrochemical performances for energy storage application. ***RSC Advances***, 4, 44777-44785 (**I.F.-3.28**).

59. Phani Kumar, M., Samanta, P., &**Murmu, N. C.,(2015)** Rigid Rotor Stability Analysis on Finite Hydrostatic Double-Layer Porous Oil Journal Bearing with Velocity Slip. ***Tribology Transactions***, 58(5), 930-940(**IF:1.75**).

60. Kumar, M. P., Samanta, P., &**Murmu**, N. C. (2015) Investigation of velocity slip effect on steady state characteristics of finite hydrostatic double-layered porous oil journal bearing. ***Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology***, 229(7), 773-784 (**IF:01.318**).

61. Chakraborty, T., Hens, A., Kulashrestha, S., **Murmu**, N. C., & Banerjee, P. (2015) Calculation of diffusion coefficient of long chain molecules using molecular dynamics. ***Physica E: Low-dimensional Systems and Nanostructures***, 69, 371-377 **(IF:2.399)**

62. Saha, S. K., Ghosh, P., Hens, A., **Murmu**, N. C., & Banerjee, P.(2015) Density functional theory and molecular dynamics simulation study on corrosion inhibition performance of mild steel by mercapto-quinoline Schiff base corrosion inhibitor. ***Physica E: Low-dimensional Systems and Nanostructures***, 66, 332-341. **(IF:2.399)**

63. Ghosh, P., Chowdhury, A. R., Saha, S. K., Ghosh, M., Pal, M., **Murmu**, N. C., & Banerjee, P. (2015) Synthesis and characterization of redox non-innocent cobalt (III) complexes of a O, N, O donor ligand: Radical generation, semi-conductivity, antibacterial and anticancer activities. ***Inorganica Chimica Acta***, 2015, 429, 99-108 (**IF:2.046**).

64. Jana, M.; Khanra, P.; **Murmu, N. C.**; Lee, J. H.; Kuila, T. (2014) Covalent surface modification of chemically derived graphene and its application as supercapacitor electrode material. ***Physical Chemistry Chemical Physics*** 2014, 16, 7618-7626. (**I.F.-3.906**).

65. Jana, M.; Khanra, P.; **Murmu, N. C.;** Lee, J. H.; Kuila, T. (2014) Bio-reduction of graphene oxide using drained water from soaked mung beans (Phaseolus aureus L) and its application as energy storage electrode material. ***Materials Science and Engineering B*** 2014, 186, 33-40. Achieved ***MSEB Best Paper Award*** from Elsevier in (*Selected from 171 Published Article*). **(I.F.-3.316)**

66. Mandal, N., Roy, H., Mondal, B., **Murmu**, N. C., & Mukhopadhyay, S. K. (2012). Mathematical Modeling of Wear Characteristics of 6061 Al-Alloy-SiCp Composite Using Response Surface Methodology. ***Journal of materials engineering and performance***, 21(1), 17-24 (**IF:1.094**).

67. Murmu, N. C. (2011) Comparison of response surface methodology and artificial neural network technique for prediction of wear of 6061 al-alloy—SiCp composite. ***International Journal of Mechanical and Materials Engineering***, 6(3), 437-444. (**IF Pending**)

Conference Proceedings

68. Chhetri, S.; Adak, N.; Samanta, P.; **Murmu, N. C.;** Kuila, T. Investigation of mechanical properties of non-covalently functionalized reduced graphene oxide/epoxy composite. Advanced Functionalized Materials Processing & Manufacturing, February 2-3, 2017, Page 18.

69. Kumar, J. S.; Balel, J.; Samanta, P.; **Murmu, N. C.;** Kuila, T. One pot synthesis of Cu_2O/RGO composite using clove extract for electrochemical sensing of hydrogen peroxide. Advanced Functionalized Materials Processing & Manufacturing, February 2-3, 2017, Page 155.

70. Jana, M.; Chandra, S.Samanta, P.; **Murmu, N. C.;** Kuila, T. Growth of Ni-Co binary hydroxide reduced graphene oxide over nickel foam substrate by a facile successive ionic layer adsorption and reduction (SILAR) method for supercapacitor applications. Advanced Functionalized Materials Processing & Manufacturing, February 2-3, 2017, Page 180.

71. Saha, S.; Samanta, P.; **Murmu, N. C.;** Kuila, T.N-doped nano graphite sheet for energy storage applications. Advanced Functionalized Materials Processing & Manufacturing, February 2-3, 2017, Page 184.

72. Jana, M.; Samanta, P.; **Murmu, N. C.;** Kim, N. H.; Kuila, T.; Lee, J. H. Development of cobalt sulfide-graphene composite for supercapacitor applications. Compos Res 2016, 29, 167-172.

73. Chhetri, S.; Samanta, P.; **Murmu, N. C.;** Kuila, T.; Lee, J. H. Enhanced mechanical properties of functionalized graphene oxide/linear low density polyethylene composites prepared by melt mixing. Compos Res 2016, 29, 173-178.

74. Saha, S.; Jana, M.; Samanta, P.; **Murmu, N. C.;** Lee, J. H.; Kuila, T. Self charging sulfanilic acid azocromotrop/reduced graphene oxide decorated nickel oxide/iron oxide solar supercapacitor for energy

storage application. Compos Res 2016, 29, 179-185.

75. Chhetri, S.; Samanta, P.; **Murmu, N. C.;** Srivastava, S. K.; Kuila, T. Electromagnetic interference shielding and thermal properties of non-covalently functionalized reduced graphene oxide/epoxy composites. AIMS Materials Science 2017, 4, 61-74.
76. **Murmu**, N. C., Samanta, P., Das, P, Numerical investigation on delamination in different coatings of cutting tools used in micro-machining applications, ASIATRIB 2014, 17-20 February, 2014 at Agra, India.
77. Sahoo, P, **Murmu**, N. C., Understanding the role of emulsifiers defined by chemistry and structure to the performance of metal working nanoemulsions. ASIATRIB 2014, 17-20 February, 2014 at Agra, India.
78. Samanta, P, Shetty, P., Banerjee, P., Kuila, T., **Murmu**, N. C., Tyre Pyrolysis Oil as a Lubricant, ASIATRIB 2014, 17-20 February, 2014 at Agra, India.
79. Samanta, P, **Murmu**, N. C., Numerical Investigation on Static and Dynamic Performances of foil air journal bearings, 8th International Conference on Industrial tribology, ICIT-2012, Pune, India.
80. **Murmu**, N. C., Samanta, P., Geometry optimization of textured micro thrust bearings, 8th International Conference on Industrial tribology, ICIT-2012, Pune, India.
81. Das, L G, Samanta, P., **Murmu**, N. C., A Unified Design Methodology for Micro Gas Turbine, 11th Asian International Conference on Fluid Machinery and 3rd Fluid Power Technology Exhibition, 21-23 November, 2011, Indian Institute of Technology, Madras, Chennai - 600 036 India.
82. **Murmu**, N C, Bhakta, D. K., Experimental investigation of lives of ball bearings at higher level of reliabilities, 7th International Conference on Industrial Tribology (ICIT'10), December 2-4, 2010, Ispat Bhawan, Ranchi, India
83. **Murmu**, N. C.,"Design of experiments based simulated analysis of air bearing and its application in optimization", International Conference on Trends in Product Life Cycles Modeling, Simulation and Synthesis (PLMSS-2008), November 17-20, 2008, Bangalore, India.
84. **Murmu**, N. C, Valgan, R., "Detection of defects in formed sheet metal using medial axis transformation (MAT)", SPIE's international Symposium for Optical Metrology, June 2003, Munich, Germany.
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Citation Indices	All	Since 2014
Citations	**996**	**985**
H-index	**19**	**19**
I10 Index	**30**	**30**

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1. High Speed Foil Bearing Housing for Small Turbo Machines (Ref. CSIR-CMERI/IPMG/DR/2014/1)
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5. A Desktop Dip pen Nanolithography system [filed 25/01/2017: CSIR-CMERI].
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Book Chapters

1. Kuila, T.; Banerjee, P.; **Murmu, N. C.** "Surface Modification of Graphene" In "Advanced Carbon Materials and Technology" Ed. A. Tiwari and S. K. Shukla, WILEY-Scrivener Publisher's Print ISBN: 9781118686232; Online ISBN: 9781118895399; DOI: 10.1002/9781118895399.
2. Kuila, T.; Dong, Y. S.; **Murmu, N. C.** "Graphene/conjugated polymer nanocomposites for optoelectronic and biological applications" in "Fundamentals of Conjugated Polymer Blends, Copolymers and Composites: Synthesis, Properties, and Applications" Ed. P. Saini, ISBN: 978-1-118-54949-0, WILEY-Scrivener Publisher's.
3. Saini, P.; Kuila, T.; Saha, S.; **Murmu, N. C.** "Graphene and its nanocomposites for gas sensing applications" in "Advanced Sensor and Detection Materials" Ed. A. Tiwari and M. M. Demir, ISBN: 978-1-118-77348-2. Wiley, USA .
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Popular Magazines

1. Abhiram Hens, P. Banerjeem Tapas Kuila, **Murmu** N. C., Nano-Patterning by Dip-Pen Nanolithography, Nano Digest, Sep, 2012, 29-30.
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The list Major Sponsored/ Consultancy Projects completed or in-progress

Industry/DST Sponsored Projects

- Design and development of Hollow Crankshaft for Automobile (2014-17) **Indo-German Science and Technology Centre (IGSTC)** [Bharat Forge Ltd, Fraunhofer Institute, Germany, Siedel, GmBH, Germany] (Rs.600 Lakh for consortium) » **Principal Investigator.**
- Graphene Ultra Capacitor Module for Hybrid Unmanned Ground Vehicles (UGV) (2017-20), **DRDO,** New Delhi, (Rs. 489 Lacs)» **Principal Investigator.**
- Developing Manufacturing Technology of Graphene-based Polymer Composite for Mechanically Stable and Thermally Durable Automotive Component, (2017-20209)**DST**, New Delhi (Rs. 30.56 Lacs) » **Principal Investigator.**
- Design and development of Electrohydrodynamic Ink Jet Printing System,(2016-2019), **DST**, New Delhi, (Rs 116 Lacs) with NIT-Durgapur » **Principal Investigator.**
- Design and development of Multi-Material Deposition (MMD) System (2013-17) **DST**, New Delhi, (Rs. 471.52 Lakh). » **Co-Principal Investigator.**
- Surface coating of nylon and stainless steel using graphene-based composite materials (2014-15), **Chonbuk National University, South Korea** (Rs.11 Lakh). » **Co-Principal Investigator.**
- Measuring Progression of Wear in Wire Drawing Process using Acoustic Emission technique (2011-13), **TATA STEEL Jamshedpur** (Rs.14.72 Lakh). »**Principal Investigator.**
- Preliminary Investigation of Graphene-Based Die Lubricants for Hot Forging Application(2014-15), **SONA BLW PRECISION FORGINGS**, (Rs 15 Lakhs) » **Principal Investigator.**
- Investigation of degradation ofhydraulic oil in Hydraulic Power Steering(2014-15) **SONA KOYO STEERING**, (Rs 16.44 Lakhs) » **Co-Principal Investigator.**
- Development of Rolling Element Bearing Testing Stands (2003-05) **TATA BEARINGS & DST**, New Delhi (Rs 39.875 Lakhs). » **Principal Investigator.**

CSIR Translation Research (out of 144 pan CSIR Projects):

- Graphene based Acquous Lubricants (2016-18) CSIR Fast Track Tranlation Research Project, New Delhi (Rs 119.64 Lakhs). » **Principal Investigator.**

CSIR-Network Project as Principal Investigator:

- Micro/Nano-Scale Surface Patterning (2013-17) CSIR –Network Project, (Rs.282 Lakh)
- Graphene-Based Rechargeable Energy Storage Micro Device (2013-17) CSIR-Network Project, (Rs.182 Lakh)
- Electro-Hydrodynamic Jet Printing System (2013-17) CSIR-Network Project CSIR-Network Project, (Rs.119 Lakh).
- µ-Actuator of Magnetic-Fluid Enabled Deformable Mirror for Retinal Imaging Adaptive Optics Systems (2012-17) CSIR –Network Project, (Rs.108 Lakh).
- Multi-Material Reconfigurable Micro Manufacturing Systems – (Task3)(2007-12) CSIR –Network Project, (Rs.312 Lakh).
- Preliminary Investigation of Dip Pen Nanolithography (2012-16) CSIR –CMERI Project, (Rs. 67.85 Lakh).
- Development of Rolling Element Bearing Standards for Aerospace Applications (2004-08) CSIR -Network Project, (Rs. 61 Lakh).

Project as Co-Principal Investigator:

- Magnetic Journal Bearing For Miniaturized/ Micro Devices (2013-17) CSIR-Network Project CSIR – Network Project, (Rs.179 Lakh).
- Developmental Studies of 5kWGas Turbine-Compressor Set (2011-14) CSIR-CMERI Project (Rs.19.96 Lakh).
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