

Kaushik Pal

*Assistant Professor,
Department of Mechanical and Industrial Engineering,
Indian Institute of Technology, Roorkee
Roorkee, Uttarakhand, Pin: 247667, India*



E-mail: palkfme@iitr.ernet.in; pl_kshk@yahoo.co.in

Phone: +91-1332-284761(O) ; +91-1332-286761(R)

Fax: +91-1332-285665/273560

Website: <http://www.iitr.ac.in/~ME/palkfme>

Date of Birth: 20th December, 1978

Country of Citizenship: India

Gender: Male

Marital Status: Married

Permanent Address:

58/7B, Kashi Nath Dutta Road, Kolkata – 700 036, W.B., India

Academic Record:

Ph. D.: Indian Institute of Technology – Kharagpur, India

Bachelor of Engineering (Mechanical Engineering): Berhampur University, India

Ph. D thesis: “Speciality Elastomer Blends for Abrasion Resistant Tyre Tread of Dump-Trucks”

Post-Doctoral Research Experience:

Elastomer Lab, Polymer Science and Technology, School of Nano and Advanced Materials, Gyeongsang National University, Jinju 660-701, Gyeongnam Republic of Korea.

Research Interests:

Blending, characterization and compatibilization of PMC's and MMC's; Polymer and metal matrix nanocomposites; Non-conventional machining; Welding of polymers; Fracture mechanics and fatigue mechanism; Recycling of polymers; Wear and Abrasion; Polymers nanocomposites for high performance sensor, actuator and supercapacitor application; Energy storage; Coating of nano fillers; Bio polymers; Nanotribology; In-situ polymerization.

Technical Experiences:

Compression Molding, Dynamic Mechanical Analyzer (2980, TA Instruments), X-Ray Diffraction (PW-1840, X-ray diffractometer), FESEM (Philips XL30 S FEG, Netherland), Scanning Probe Microscope (XE-100(PSIA), Monsanto Rheometer (Monsanto Rheometer R-100), Differential Scanning Calorimeter (NETZSCH DSC 200 PC, Germany), Thermo Gravimetric Analyzer (TG Analyzer, NETZSCH, TG 209, F1, Germany), Tensile Testing Machine (Hounsfield H10KS), Mixing Mill (6”×12” and 14”×36”), Extruder (hot feed 8” rubber extruder and twin screw extruder), Capillary Rheometer, Goodrich Flexometer, DIN abrader and Du-Pont abrader for rubber wear measurement.

Membership of Professional Bodies:

1. Member – American Chemical Society (ACS).
2. Associate Member - Institution of Nano Technology (Scotland).

3. Associate Member (AM096224/7) - Institution of Engineers (India).
4. Life Member (LMB 1056) - Materials Research Society of India (MRSI).
5. Member – Polymer Society (Republic of Korea).

Honours and Awards:

1. I-cube BK-21 fellowship offered by Korean Government for two years (01.02.2009-28.02.2011) research in Republic of Korea.

Academic Responsibilities:

1. Training and Placement Officer (TPO), NIT Agartala from July, 2011- August, 2012.

Achievements:

1. Editorial Board Member: Scientific Journal International (SJI), USA, 2009.
2. Editorial board member: International Journal of Materials Engineering and Technology.
3. Editorial board member: Journal of Chemical Engineering and Materials Science (JCEMS), Academic Journals.
4. Reviewer: Polymer Engineering & Science Journal (Wiley InterScience), 2008.
5. Reviewer: Journal of Applied Polymer Science (Wiley InterScience), 2008.
6. Reviewer: Materials & Design (Elsevier), 2009.
7. Reviewer: Journal of Current Nano Science (CNANO) (Bentham Science Publishers), 2009.
8. Reviewer: Journal of Polymer Composites (Wiley InterScience), 2009.
9. Reviewer: Tribology International (Elsevier), 2009.
10. Reviewer: Journal of Nanoparticle Research (Springer), 2009.
11. Reviewer: Journal of Hazardous Materials (Elsevier), 2009.
12. Reviewer: Journal of Thermoplastic Composite Materials (Sage Publications), 2009.
13. Reviewer: Langmuir (ACS), 2009.
14. Reviewer: Journal of Physical Chemistry C (ACS), 2010.
15. Reviewer: Polymer for Advanced Technologies (Wiley InterScience), 2010.
16. Reviewer: Journal of Polymer Research (Springer), 2010.
17. Reviewer: Express Polymer Letters, 2010.
18. Reviewer: Polymer (Elsevier), 2010.
19. Reviewer: Journal of Vinyl and Additive Technology (Wiley InterScience), 2010.
20. Reviewer: Cryst. Eng. Comm. (Royal Chemical Society), 2011

Conferences/visit abroad:

1. Ramadan City and Hurghada, Cairo, Egypt from November 14th-24th, 2007, “9th Arab International Conference on Polymer Science and Technology”.
2. Daejeon, South Korea, from April 9th -10th, 2009, Polymer Conference, Polymer Society of Korea.
3. Seoul, South Korea, from May 21st -22nd, 2009, Korean Institute of Resources Recycling Conference,

Korean Resource Recycling Society.

4. Osaka University, Japan from July 27th – 29th, 2010, Symposium jointly organized by Osaka University and Gyeongsang National University.
5. Beijing, P. R. China from October 10th – 13th, 2010, The 2nd International Conference on Nanomechanics and Nanocomposites (ICNN-2010).
6. Jeju, South Korea, from May 21st -24th, 2012, IRC-2012, International Rubber Society.

Contributions to Book Chapters and Book:

1. C. K. Das, **Kaushik Pal**, R. Rajasekar, “Polyolefin Nanocomposites through in-situ Polymerization Approach”, Chapter 7, Ed. Vikas Mittal, ‘Advances in Polymer Nanocomposites Technology’, 2009, Nova Science Publishers, New York, USA, ISBN: 978-1-60741-970-9 - In press.
2. Shu Ling Zhang, **Kaushik Pal**, Jin Kuk Kim, ‘Prediction of mechanical properties of polypropylene/waste ground rubber tire powder composites via uniform design and artificial neural networks’, Chapter 31, Ed. Seoyun J. Kwon, ‘Artificial Neural Networks’, 2010, Nova Science Publishers, New York, USA- ISBN:978-1-61761-553-5- In Press.
3. Vikas Mittal, Jin Kuk Kim, **Kaushik Pal**, “Recent Advances in Elastomeric Nanocomposites”, 2010, Springer-Verlag, Germany- DOI: 10.1007/978-3-642-15787-5_2, ISBN: 978-3-642-15786-8.
4. Jin Kuk Kim, **Kaushik Pal**, “Recent Advancement in Processing of Wood-Plastic Composites (WPC) Foam”, 2010, Springer-Verlag, Germany- DOI: 10.1007/978-3-642-14877-4, ISBN: 978-3-642-14876-7.
5. **Kaushik Pal**, Jin Kuk Kim, “Thermal conductivity improvement of PEEK/ZrO₂ coated MWCNT nanocomposites”, 2010, Ed. Boreddy Reddy, ‘Advances in Nanocomposites - Synthesis, Characterization and Industrial Applications’, 2011, InTech Publications, Austria, ISBN 978-953-307-165-7.
6. **Kaushik Pal**, Jin Kuk Kim, “Multi phase materials”, 2012-in progress.

Patents:

1. “Conductive Nano-Tube Filled Polymer Composite and Method for Producing Same”- Application No: 1111/KOL/2011, Filing Date: 24/08/2011-Submitted.
2. “Novel composition for conductive nanotube filled elastomer & method for producing the same”- Application No: 1110/KOL/2011, Filing Date: 24/08/2011-Submitted.

Sponsored Projects Handled:

1. Use of un-modified and modified nano fillers for sensor applications (**SERC/ET-0110/2011**), Sponsored by DST-in progress.

Publications:

International Journal

2007-2008:

1. T. Das, **Kaushik Pal**, B. Adhikari, C. K. Das, “Effect of Compatibilizers on the Morphological Properties of ABS and LCP Blends”, *Research Letters in Materials Science*, Vol. 2007, 2007, pp. 1-4 - DOI:10.1155/2007/18160.
2. R. Rajasekar, Tanya Das, **Kaushik Pal**, S. K. Pal, Zheng Peng, Ying Chen, C. K. Das, “Use of ENR / Nanoclay Composites in NR gum compounds”, *Nano Trends*, Vol. 3, Issue 1, 2007, pp. 1-15.

2008-2009:

3. **Kaushik Pal**, T. Das, S. K. Pal, C. K. Das, “Use of carboxylated nitrile rubber and natural rubber

blends as retreading compound for OTR tyres”, *Polymer Engineering and Science*, Volume 48, No. 12, pp. 2410-2417, 2008 – DOI: 10.1002/pen.21196.

2009-2010:

4. **Kaushik Pal**, T. Das, R. Rajasekar, S. K. Pal, C. K. Das, “Wear characteristics of styrene butadiene rubber/natural rubber tyre retreading blends with different types of carbon black by DIN abrader and different mining rock surfaces”, *Journal of Applied Polymer Science*, Volume 111, Issue 1, pp. 348-357, 2009 – DOI: 10.1002/app.29128.
5. R. Rajasekar, **Kaushik Pal**, C. K. Das, “Effect of epoxidized natural rubber in high styrene rubber - nanoclay compounds in presence and absence of carbon black”, *International Journal of Polymers and Technologies*, 2009 – Volume 1, No. 2-3, pp. 155-164, 2009 – ISSN: 0973-6743.
6. R. Rajasekar, **Kaushik Pal**, G. Heinrich, A. Das, C. K. Das, “Development of NBR-Nanoclay Composites with Epoxidized Natural Rubber as Compatibilizer”, *Materials & Design*, Volume 30, Issue 9, pp. 3839-3845, 2009 – DOI:10.1016/j.matdes.2009.03.014.
7. Zhen Xiang Xin, Zhen Xiu Zhang, **Kaushik Pal**, Bing Xue Lu, Xu Deng, Sung Hyo Lee, Jin Kuk Kim, “Effects of formulation and processing parameters on the morphology of extruded polypropylene-(waste ground rubber tire powder) foams”, *Journal of Vinyl and Additive Technology*, Volume 15, Issue 4, pp. 266-274, 2009 – DOI: 10.1002/vnl.20191.
8. Dong Jin Kang, Seung Kuk Kwak, **Kaushik Pal**, Zhen Xiu Zhang, Dae Suk Bang, Jin Kuk Kim, “Preparation and characterization of grafting maleic anhydride onto polypropylene by reactive extruder”, *Polymer Journal (Korea)*, Volume 33, No. 4, pp. 353-363, 2009.
9. **Kaushik Pal**, R. Rajasekar, Dong Jin Kang, Zhen Xiu Zhang, Jin Kuk Kim, C. K. Das, “Effect of Epoxidized Natural Rubber-Organoclay nanocomposites on NR/High Styrene Rubber blends with fillers”, *Materials and Design*, Volume 30, Issue 10, pp. 4035-4042, 2009 – DOI:10.1016/j.matdes.2009.05.021.
10. **Kaushik Pal**, R. Rajasekar, T. Das, Dong Jin Kang, Samir K. Pal, Jin Kuk Kim, Chapal K. Das, “Effect of fillers on morphological properties in NR/SBR blends for OTR tyres”, *Plastic, Rubber and Composites-Macromolecular Engineering*, Volume 38, No. 7, pp. 302-308, 2009 – DOI: 10.1179/174328909X435393.
11. Zhen Xiang Xin, Zhen Xiu Zhang, **Kaushik Pal**, Dong Jin Kang, Sung Hyo Lee, Jin Kuk Kim, “Effects of Waste Ground Rubber Tire Powder (WGRT) and Chemical Blowing Agent Content on the Cell Morphology and Physicomechanical Properties of Injection-Molded Polypropylene/WGRT Foams”, *Journal of Vinyl and Additive Technology*, Volume 15, Issue 4, pp. 275-280, 2009 – DOI: 10.1002/vnl.20198.
12. Dong Jin Kang, Deng Xu, Zhen Xiu Zhang, **Kaushik Pal**, Dae Suk Bang, Jin Kuk Kim, “Well-controlled microcellular PLA/Silk biodegradable composite foams with Supercritical CO₂”, *Macromolecular Materials and Engineering*, Volume 294, Issue 9, pp. 620-624, 2009 – DOI: 10.1002/mame.200900103.
13. Zhen Xiang Xin, Zhen Xiu Zhang, **Kaushik Pal**, Kwang-Jea Kim, Dong Jin Kang, Dae-Suk Bang, Jin Kuk Kim, “Microcellular Structure of PP/Waste Rubber Powder Blends with Supercritical CO₂ by Foam Extrusion Process”, *Journal of Cellular Plastics*, Volume 45, Issue 6, pp. 499-514, 2009–DOI:10.1177/0021955X09342937.
14. Zhen Xiang Xin, Zhen Xiu Zhang, Bao Sheng Zhang, **Kaushik Pal**, Xu Deng, Sung Hyo Lee, Jin Kuk Kim, “Expanded Waste Ground Rubber Tire Powder/Polypropylene Composites: Processing-Structure Relationships”, *Journal of Composite Materials*, Volume 43, Issue 24, pp. 3003-3015, 2009 - DOI: 10.1177/0021998308345346.

2010-2011:

15. **Kaushik Pal**, R. Rajasekar, S. K. Pal, Jin Kuk Kim, C. K. Das, "Influence of fillers on NR/SBR blends containing ENR-Organoclay nanocomposites: Morphology and Wear", *Journal of Nanoscience and Nanotechnology*, Vol.10, Issue 5, pp. 3022–3033, 2010 – DOI:10.1166/jnn.2010.2170.
16. Zhen Xiang Xin, Zhen Xiu Zhang, **Kaushik Pal**, Jong Ung Byeon, Sung Hyo Lee, Jin Kuk Kim, "Study of Microcellular Injection-Molded Polypropylene/Waste Ground Rubber Tire Powder blend", *Materials and Design*, Volume 31, Issue 1, pp. 589-593, 2010 – DOI: 10.1016/j.matdes.2009.07.002.
17. **Kaushik Pal**, R. Rajasekar, Dong Jin Kang, Zhen Xiu Zhang, S. K. Pal, Jin Kuk Kim, C. K. Das, "Effect of fillers and nitrile blended PVC on NR/HSR with nano silica blends: Morphology and Wear", *Materials and Design*, Volume 31, Issue 1, pp. 25-34, 2010 – DOI: 10.1016/j.matdes.2009.07.023.
18. **Kaushik Pal**, R. Rajasekar, Dong Jin Kang, Zhen Xiu Zhang, S. K. Pal, C. K. Das, Jin Kuk Kim, "Effect of fillers on Natural Rubber/ High Styrene Rubber blends with nano silica: Morphology and Wear", *Materials and Design*, Volume 31, Issue 2, pp. 677-686, 2010 – DOI: 10.1016/j.matdes.2009.08.014.
19. **Kaushik Pal**, R. Rajasekar, Dong Jin Kang, Zhen Xiu Zhang, Samir K. Pal, Chapal K. Das, Jin Kuk Kim, "Influence of carbon blacks on Butadiene rubber/ High styrene rubber/ Natural rubber with nano silica: Morphology and Wear", *Materials and Design*, Volume 31, Issue 3, pp. 1156-1164, 2010 – DOI: 10.1016/j.matdes.2009.09.037.
20. Dong Jin Kang, **Kaushik Pal**, Se Jeong Park, Dae Suk Bang, Jin Kuk Kim, Effect of eggshell and silk fibroin on styrene-ethylene/butylene-styrene as bio filler, *Materials and Design*, Volume 31, Issue 4, pp. 2216-2219, 2010- DOI: 10.1016/j.matdes.2009.10.033.
21. **Kaushik Pal**, Dong Jin Kang, Zhen Xiu Zhang, Jin Kuk Kim, "Synergistic Effects of Zirconia-coated Carbon Nanotube on Crystalline Structure of Polyvinylidene fluoride nanocomposites: Electrical Properties and Flame-Retardant Behavior", *Langmuir*, Volume 26, Issue 5, pp. 3609-3614, 2010 -DOI: 10.1021/la903022j.
22. Shu Ling Zhang, Zhen Xiu Zhang, Zhen Xiang Xin, **Kaushik Pal**, Jin Kuk Kim, "Prediction of mechanical properties of polypropylene/waste ground rubber tire powder treated by bitumen composites via uniform design and artificial neural networks", *Materials and Design*, Volume 31, Issue 4, pp. 1900-1905, 2010– DOI: 10.1016/j.matdes.2009.10.057.
23. S. Bose, M. Mukherjee, **Kaushik Pal**, G. C. Nayak, C. K. Das, "Development of Core-Shell structure aided by SiC-coated MWNT in ABS/ LCP blend", *Polymer for Advanced Technologies*, Volume 21, Issue 4, pp. 272-278, 2010 – DOI: 10.1002/pat.1425.
24. **Kaushik Pal**, R. Rajasekar, Dong Jin Kang, Zhen Xiu Zhang, Samir K. Pal, Chapal K. Das, Jin Kuk Kim, "Effect of filler and urethane rubber on NR/BR with nanosilica: Morphology and wear", *Journal of Thermoplastic Composite Materials*, Volume 23, Issue 5, pp. 717-739, 2010 – DOI: 10.1177/0892705709355234.
25. **Kaushik Pal**, Samir K. Pal, Chapal K. Das, Jin Kuk Kim, "Influence of fillers on NR/SBR/XNBR blends. Morphology and Wear", *Tribology International*, Volume 43, Issue 8, pp. 1542-1550, 2010 – doi:10.1016/j.triboint.2010.02.015.
26. Shu Ling Zhang, Zhen Xiu Zhang, **Kaushik Pal**, Zhen Xiang Xin, Joshua Suh, Jin Kuk Kim, "Prediction of mechanical properties of waste polypropylene/waste ground rubber tire powder blends using artificial neural networks", *Materials and Design*, Volume 31, Issue 8, pp. 3624-3629, 2010– DOI: 10.1016/j.matdes.2010.02.039.
27. **Kaushik Pal**, S. K. Pal, Jin Kuk Kim, C. K. Das, "Effect of carbon black on wear mechanism of XNBR/NR blends", *Materials and Design*, Volume 31, Issue 10, pp. 4792-4799, 2010 – DOI:

10.1016/j.matdes.2010.05.006.

28. Zhen Xiang Xin, Zhen Xiu Zhang, **Kaushik Pal**, Dong Jin Kang, Jin Kuk Kim, “Influence of compatibilizers and processing temperature on microcellular injection-molded polypropylene/(waste tire powder) composites”, *Journal of Vinyl and Additive Technology*, Volume 17, Issue 4, December 2011, Pages: 254–259, 2010, DOI: 10.1002/vnl.20271.

2011-2012:

29. Chen Zhang, **Kaushik Pal**, Jong-Ung Byeon, Sang-Min Han, Jin Kuk Kim, “A Study of Mechanical and Thermal Properties of Silicone Rubber/EPDM Damping Materials”, *Journal of Applied Polymer Science*, Volume 119, Issue 5, 2011, pp. 2737–2741 –DOI: 10.1002/app.31697.
30. Chen Zhang, Zhen Xiu Zhang, **Kaushik Pal**, Oe Gi Shin, Hyeon Choel Jo, Sung Hoon Lee, Jin Kuk Kim, “Effect of Silanes on Mechanical and Thermal Properties of Silicone Rubber/ EPDM Blends”, *Journal of Macromolecular Science Part B Physics*, Volume 50, Issue 2, 2011 , pp. 291 - 299 – DOI: 10.1080/00222341003651494.
31. Chen Zhang, Lei Liu, Zhen Xiu Zhang, **Kaushik Pal**, Jin Kuk Kim, “Effect of silica and silicone oil on the mechanical and thermal properties of silicone rubber”, *Journal of Macromolecular Science Part B Physics*, Volume 50, Issue 6, 2011, pages 1144-1153 – DOI:10.1080/08941920.2010.518533.
32. **Kaushik Pal**, Samir K. Pal, Chapal K. Das, Jin Kuk Kim, “Effect of fillers on morphological properties and wear characteristics of XNBR/NR blends”, *Journal of Applied Polymer Science*, Volume 120, Issue 2, 2011, pp. 710–718 – DOI: 10.1002/app.33234.
33. **Kaushik Pal**, Dong Jin Kang, Jin Kuk Kim, “Microstructural investigations of zirconium oxide– on core-shell structure of carbon nanotubes”, *Journal of Nanoparticle Research*, Volume 13, Number 6, pp. 2597-2607, DOI: 10.1007/s11051-010-0152-7.
34. Dong Jin Kang, **Kaushik Pal**, Dae Suk Bang, Jin Kuk Kim, “Synergistic effect on crystalline structure of PVDF nanocomposites with different loading by a Twin Screw Extruder”, *Journal of Applied Polymer Science*, Volume 121, Issue 1, 2011, Pages: 226–233, DOI: 10.1002/app.33524.

2012-2013:

35. **Kaushik Pal**, Samir K. Pal, Chapal K. Das, Jin Kuk Kim, “Effect of fillers on morphological and wear characteristics of NR/HSR blends with E-glass fibre”, *Materials and Design*, Volume 35, Issue R1-R2, pp. 863-872, 2012 – DOI: 10.1016/j.matdes.2011.07.074.
36. **Kaushik Pal**, Dong Jin Kang, Zhen Xiu Zhang, Jin Kuk Kim, Dae Suk Bang, “Influence of Pristine and Metal MWCNT on PLA/ABS Blends: Morphology and Electrical Conductivity”, *Advanced Science Letters*, Volume 18, pp. 114-120, 2012 – DOI: 10.1166/asl.2012.4874.
37. **Kaushik Pal**, Madhumita Mukherjee, Stanislaw Frackowiak, Marek Kozlowski, Chapal K. Das, “Improvement of Physico-Mechanical Properties and stability of Waste PP in presence of Wood Flour and MAH-g-PP”, *Journal of Vinyl and Additive Technology*, May 2012 – Accepted.
38. **Kaushik Pal**, Narayan Debnath, Jin Kuk Kim, “Enhanced percolation threshold and dielectric of MWNT reinforced EVA: Role of fillers based capacitor applications”, *Advanced Science Letters*, August 2012 – Communicated.
39. **Kaushik Pal**, Jin Kuk Kim, “Role of fillers on halloysite nanotube and clay assisted dispersion of fluoroelastomeric based high performance dielectric energy storage application”, *Journal of Nanoscience and Nanotechnology*, August 2012 – Communicated.

Magazine

- i. Performance Materials Alert, Use of Abrasion Resistance Tires in Mining Applications, 2009, Frost &

Sullivan.

- ii. S. L. Zhang, Z. X. Zhang, **K. Pal**, D. J. Kang, D. S. Bang, J. K. Kim, Preparation and characterization of thermoplastic elastomers (TPE) based on waste polypropylene and waste ground rubber tyre powder, *International Magazine on Thermoplastic Elastomers*, Volume 1, June 2009, pp. 32-35.

National Journal

- i. **Kaushik Pal**, Dr. Samir K. Pal, Prof. Subir K. Mukhopadhyay, "Augmentation of Automobile Tyres Life in Mineral Industry through Improved Material Properties, *Mining Engineers' Journal*, Vol. 7, No. 5, December 2005.
- ii. Pranav Kumar, **Kaushik Pal**, Dr. Samir K. Pal, "Experiments on the Consequence of Reinforcing of the Jointed Mine Model Pillar by Various Fly Ash Composites – a Laboratory Based Study", Mining Engineering Division, Journal of Institution of Engineers (India), Vol. 88, pp. 27-33, August 2007.
- iii. R. Rajasekar, **Kaushik Pal**, S. K. Pal, Zheng Peng, Ying Chen, C. K. Das, "Effect of Epoxidized natural rubber – Nanoclay composites in carbon black filled natural rubber vulcanizates", *The ICAI Journal of Science & Technology*, Vol. 4, No. 1, 2008, pp. 17-29.

International Symposium / Conference

- i. **Kaushik Pal**, "Review of Corrosion Protection by Implementing New Techniques in Rock Cutting Tools", International Geomintech Symposium (ENTMS 2004), May 11-12' 04, pp 131-136
- ii. Pranav Kumar, **Kaushik Pal**, Dr. Samir K. Pal, "Experimental Study of the Jointed Mine Model Pillar", International Geomintech Symposium ENTMS 2006 on 'New equipment – new technology management and safety in mining and mineral based industries', May 10-11' 06.
- iii. **Kaushik Pal**, T. Pal, S. K. Pal, C. K. Das, "The development of SBR/NR blends with different grades of carbon black for OTR tyre applications", 9th Arab International Rubber Conference on Polymer Science and Technology, Hurghada, Cairo, Egypt, 18th – 22nd November, 2007.
- iv. **Kaushik Pal**, S. K. Pal, R. Rajasekar, C. K. Das, "Wear characteristics of XNBR - NR tyre retreading blends with different types of CB by DIN abrader and different mining rock surfaces", 9th Arab International Conference on Polymer Science and Technology, Hurghada, Cairo, Egypt, 18th – 22nd November, 2007.
- v. **Kaushik Pal**, S. K. Pal, "Augmentation of rubber tyre life through enriched material properties in mineral industry- a review" International Geomintech Symposium ENTMS 2008 on 'New equipment- new technology management and safety in mines and mineral based industries-2008', May 11-12'2008.
- vi. R. Rajasekar, **Kaushik Pal**, C. K. Das, "Effect of Epoxidized natural rubber - Nanoclay composites in Styrene Butadiene rubber compounds", India Rubber Expo 2009, 5th International Exhibition, Conference and Reverse Buyer-Seller Meet, Kolkata, January 28-31, 2009.
- vii. S. Bose, M. Mukherjee, **Kaushik Pal**, G. C. Nayak, C. K. Das, "Development of Core-Shell structure aided by SiC-coated MWNT in ABS/ LCP blend, International Conference on Hi-Tech Materials (ICHTM-09), Kharagpur, February 11-13, 2009.
- viii. **Kaushik Pal**, Madhumita Mukherjee, Saswata Bose, R. Rajasekar, Stanislaw Frackowiak, Marek Kozlowski, Chapal K. Das, "Recycling of Waste PP by Wood Flour and MAH-g-PP", International Conference on Hi-Tech Materials (ICHTM-09), Kharagpur, February 11-13, 2009.
- ix. R. Rajasekar, **Kaushik Pal**, C. K. Das, "Development of EPDM - Nanoclay composites with Epoxidized natural rubber", International Conference on Hi-Tech Materials (ICHTM-09), Kharagpur, February 11-13, 2009.
- x. M. Mukherjee, R. Rajasekar, **Kaushik Pal**, C. K. Das, T. N. Chung, G. Mennig, "Effect of type of

- Kevlar fiber on the properties and flow behavior of s-PS/Kevlar composites”, 25th Annual meeting of The Polymer Processing Society (PPS-25), Goa, March 1-5, 2009.
- xi. Dae-Suk Bang, Zhen Xiang Xin, Z. X. Zhang, **K. Pal**, D. J. Kang, and J. K. Kim, “Processing of Polypropylene and Waste Ground Rubber Tire Blend Foam Prepared in an Extrusion Using Supercritical Carbon Dioxide”, The 10th International Symposium on East Asian Resources Recycling Technology (EARTH 2009), Jeju, Republic of Korea, November 2-6, 2009.
 - xii. **Kaushik Pal**, Jin Kuk Kim, Development of core-shell structure synthesis by ZrO₂ in SWNT and MWNT nanocomposites, International Conference on Advanced Nanomaterials and Nanotechnology (ICANN-2009), IIT, Guwahati, December 9-11, 2009.
 - xiii. **Kaushik Pal**, Jong ung Byeon, Jin Kuk Kim, Role of fillers on halloysite nanotube and clay assisted dispersion of fluoroelastomeric based high performance electronic device, 5th COE exchange programme, Osaka University, Osaka, Japan, July 27-29, 2010.
 - xiv. Jong ung Byeon, **Kaushik Pal**, Jin kuk Kim, Carbon nanotube-based thin film acoustic actuators and sensors, 5th COE exchange programme, Osaka University, Osaka, Japan, July 27-29, 2010.
 - xv. Choi you-jin, **Kaushik Pal**, Jong ung Byeon, Jin kuk Kim, Thermal conductivity improvement of PEEK/ZrO₂ coated MWCNT nanocomposites, 5th COE exchange programme, Osaka University, Osaka, Japan, July 27-29, 2010.
 - xvi. Lei Liu, Hyuk Lee, Mengzhong Cui, **Kaushik Pal**, Jin Kuk Kim, Synthesis and characterization of Epoxidized Soybean oil (ESO)-based biopolybutadiene, IWGC-6 (Green Composites), Kumoh, South Korea, September 8-10, 2010.
 - xvii. **Kaushik Pal**, Jin Kuk Kim, “Role of fillers on halloysite nanotube and clay assisted dispersion of fluoroelastomeric based electronic device”, The 2nd International Conference on Nanomechanics and Nanocomposites (ICNN), Beijing, P. R. China, October 10-13, 2010.
 - xviii. **Kaushik Pal**, Jin Kuk Kim, “Role of fillers on halloysite nanotube and clay assisted dispersion of fluoroelastomeric based high performance electronic device application” IRC 2010, Mumbai, India, November 17-19, 2010.

National Symposium / Conference

- i. Dr. Samir K. Pal and **Kaushik Pal**, “Status Review of Abrasion Resistant Tyres in Mining Industry”, Proceedings of ‘TIMAS’, ISM Dhanbad, Nov 21-22’03
- ii. **Kaushik Pal**, “Literature Review on Advances in Corrosion Resistant Materials in Metals”, Proceedings of ‘CONFLUENCE’, NIT Rourkela, Jan 10-11’04, P-78
- iii. **Kaushik Pal**, “Using Composite for Minimization of Cutting Tools Wear”, Proceedings of ‘SAYANTRIK’, NIT Warangal, March 10-11’04
- iv. **Kaushik Pal**, R. Rajasekar, C. K. Das, “Morphology and wear characteristics of NR/HSR blends containing ENR-Organoclay nanocomposites in presence of carbon black”, 20th Rubber Conference, IRMRA, Mumbai, December 19-20, 2008.
- v. R. Rajasekar, **Kaushik Pal**, C. K. Das, “Effect of Epoxidized natural rubber - Nanoclay composites in Nitrile rubber compounds”, 20th Rubber Conference, IRMRA, Mumbai, December 19-20, 2008.
- vi. S. Bose, M. Mukherjee, **Kaushik Pal**, A. Ranjan, A. K. Saxena, C. K. Das, “Application of Scanning Electron Microscopy (SEM) to Study the Compatibility in Polymer based Systems in Presence of Nanofillers and Elastomeric Compatibilizers”, National Conference on Electron Microscopy & Allied Fields & XXX Annual Meeting of EMSI, Bundelkhand University, Jhansi, January 17-19, 2009.
- vii. Dong Jin Kang, S. L. Zhang, Z. X. Zhang, **K. Pal**, D. S. Bang, J. K. Kim, “Preparation and

Characterization of Thermoplastic Elastomers (TPEs) Based on Waste Polypropylene and Waste Ground Rubber Tire Powder”, Korean Institute of Resources Recycling Conference, May 21st -22nd, 2009.

- viii. Zhen Xiang Xin, Z. X. Zhang, **K. Pal**, D. J. Kang, J. K. Kim, “Generation of Fine-Celled polypropylene and waste ground rubber tire powder composite foams using supercritical CO₂ as blowing agent”, Korean Institute of Resources Recycling Conference, May 21st -22nd, 2009.
- ix. **Kaushik Pal**, Dong Jin Kang, Zhen Xiu Zhang, Jin Kuk Kim, “Influence of Pristine and Metal MWCNT on PLA/ABS Blends: Morphology and Electrical Conductivity” Polymer Society of Korea, Kwang-ju, Republic of Korea, October 7-9, 2009.
- x. Zhen Xiu Zhang, Zhen Xiang Xin, **Kaushik Pal**, Jin Kuk Kim, Preparation of Thermoplastic Elastomer (TPE) and Microcellular TPE foam, The Rubber Society of Korea, Jinju, Republic of Korea, November 6, 2009.
- xi. **Kaushik Pal**, Jong-ung Byeon, Jin Kuk Kim, “Role of fillers on halloysite nanotube and clay assisted dispersion of fluoroelastomeric based electronic device” Rubber Society of Korea, Suwon, Republic of Korea, March 26, 2010.
- xii. Lei Liu, Hyuk Lee, Mengzhong Cui, **Kaushik Pal**, Jongung Byeon, Jin Kuk Kim, “Preparation and characterization of novel epoxidized Soybean oil (ESBO)-based biopolymers” Rubber Society of Korea, Suwon, Republic of Korea, March 26, 2010.

Teaching Experience:

1. Undergraduate study – Advanced Mathematics, Spring Semester (From 02.03.2010-31.05.2010) in School of Nano and Advanced Materials, Gyeongsang National University, Jinju 660-701, Gyeongnam Republic of Korea.
2. B. Tech Courses: Mechanical Measurements, Advanced Machine Design, Manufacturing Technology-II (Mechanical Engg.), CNC, Automation and Robotics (Production Engg.), Material Science (Chemical Engg.), Manufacturing Techniques.
3. M. Tech Courses: Advance Manufacturing Processes.

Details of Ph. D students guided / Continuing:

Sr. No.	Name of Student	Year	Title of the Dissertation	Progress
1	Mr. Narayan Debnath	2012	Use of fillers for sensor and actuators application	Continuing
2	Ms. Tanima Bhattacharjya	2012	Performance characteristics and optimization utilization of power for solar PV cell	Continuing
3	Mr. Subhas Singh	2013	Development of composite materials for micro stress cracking	Continuing

Visiting lab Details:

1. Working at Applied Chemistry Division (ACD), DMSRDE, Kanpur, INDIA under DRDO for preparation of Polyphosphazene from 17.11.08 to 28.11.08.

Computer Awareness:

MS-DOS, C- Programming, AutoCAD 2000 and programming mode, CAM and Master CAM, ANSYS 8.0 and Introduction to IDEAS and CATIA, Fluidics control, ISO 9000, MATLAB, ANSYS.

Languages known:

English, Bengali, Hindi, German and Korean.