

# PASHUPATI POKHAREL, PhD

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## Profile

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Materials scientist with professional expertise in structure-property relationships of polymer nanocomposites, fracture mechanism of polymer, polymer testing, thermal, mechanical and electrical properties of polymer nanocomposites, modification of carbon nanomaterials, synthesis of advanced energy/bio-materials.

## Current immigrant status

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USA permanent resident, Eligible to work in the USA with any employer

## Education and Training

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**Ph.D., Chemical Engineering** Aug 2008– Feb 2014

**Department of Semiconductors and Chemical Engineering, Chonbuk National**

**University, Jeonju, 561-756, Republic of Korea, Advisor: Prof. Dai Soo Lee, Dissertation**

*title: "Properties of carbon nanomaterials based polyurethane nanocomposites prepared via in-situ polymerization."*

**M. Sc., Inorganic Chemistry** Aug 2003- Jul 2005

**Central Department of Chemistry, Tribhuvan University, Kritipur, Kathmandu, Nepal**

**B. Sc., Chemistry** Aug 2000- Jul 2003

**Tri-Chandra College, Tribhuvan University, Kathmandu, Nepal**

**I. Sc., Biological Science** Aug 1997- Jul 2000

**Tri-Chandra College, Tribhuvan University, Kathmandu, Nepal**

## Skills

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- General mechanical tests, X-Ray-diffraction (WAXS and SAXS)
- DSC, TGA, FT-IR, Raman, UV, PL, CV, GPC, NMR, AFM, SEM

- Chemical modifications, Synthesis, Autoclave, Electrospinning
- Dynamic mechanical analysis (Storage modulus, Loss modulus, Tan delta, stress relaxation)
- Rheology (oscillatory, rotational, stress relaxation, creep and creep recovery)
- M.S. Office, Adobe Photoshop, Origin, Chem Draw, Sigma Plot

## Professional Experience

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### Postdoctoral Research Fellow

Mar 2014- Jan 2017

**Hannam University-** Daejeon, South Korea

- Supervising/Mentoring undergraduate and graduate students in the laboratory procedures and related theories.
- Synthesis of advanced energy materials, Modification of graphene, Preparation of graphene/polyolefin master-batches, Processing of polymer and polymer composite thin film, Polymer self-assembly, Study the thermal, mechanical, and electrical properties of polymer composites, Polymer testing, Fracture mechanism of thermoplastic.
- Handling the major project of laboratory from the Ministry of Trade, Industry and Energy, South Korea as a group leader.
- Radiation cross-linking of high density polyethylene, Mechanical properties of thermoplastic polymers (Fatigue, Creep, Tensile).

### Research Assistant

Aug 2008- Feb 2014

**Chonbuk National University-** Jeonju, South Korea

Modification of carbon nanomaterials, Enhancement on the thermal, mechanical, and electrical properties of polymer nanocomposites, Production of the electrically conductive adhesives, Synthesis of the thermoplastic elastomers and their nanocomposites using different polymerization methods.

### Chemistry Instructor

Jun 2006- Aug 2008

**National College of Advance Learning (NIST), Tribhuvan University affiliated College-** Kathmandu, Nepal

Handling the theory and practical classes of chemistry for undergraduate students.

## Honours, Awards and Memberships

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- Listed in 2000 Outstanding Intellectuals of the 21<sup>st</sup> Century by International Biographical Centre 10<sup>th</sup> Edition, 2017
- Listed in Marquis Who's Who in the World 33<sup>rd</sup> Edition, 2016
- President of Chonbuk National University (CBNU) Nepali Society, CBNU Nepali Club, Aug 2012- Jul 2013
- Fellow, Brain Korea 21, Chonbuk National University, Korean Government 2008.
- Member of Korean Polymer Society
- Member of Korean Polyurethane Society
- Member of Nepal Chemical Society

## Journal Editor and Referee

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**Lead Guest Editor** in the International Journal of Polymer Science on the special issue “**Fabrication and Biomedical Applications of Biopolymer-Based Nanostructured Materials**”; **Lead Guest Editor** in the Journal of Nanomaterials on the special issue “**Polymer Nanocomposites in Environmental Remediation**”; **Referee** in Nanotechnology; Polymer; Polymers; 2D Materials; Journal of Applied Polymer Science; Journal of Hazardous Materials; Composite part A: Applied Science and Manufacturing; Composite part B: Engineering; Polymer Bulletin; Arabian Journal of Chemistry; Biomedical Materials; Progress in Organic Coatings; Journal of Physics D: Applied Physics; Polymer Engineering and Science

## Publications

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- **Pashupati Pokharel** and Dai Soo Lee “Rheology and electrical properties of polyurethane filled with hybrid of graphene nanoplatelets, carbon black, and carbon nanotubes.” *Manuscript ready for submission in Carbon 2017.*
- **Pashupati Pokharel**, Sunwoong Choi and Dai Soo Lee “Utilization of isocyanate blocking reaction for the preparation of highly conductive graphene/polyurethane nanocomposites: Thoughtful concern of the environment.” *Manuscript under preparation 2017.*
- **Pashupati Pokharel**, Wei Jian and Sunwoong Choi “Evaluation of fatigue crack behavior in e-beam irradiated polyethylene pipes.” *Radiation Physics and Chemistry 2016,126,103-110.*

- **Pashupati Pokharel**, Bishweshwar Pant, Jung-gyu Lim, Kshitiz Pokhrel, Hem Raj Pant, Dai Soo Lee, Hak-Yong Kim and Sunwoong Choi “Effects of functional groups on the graphene sheet for improving the thermomechanical properties of polyurethane nanocomposites.” *Composites Part B, Engineering*, 2015,78,192-201.
- **Pashupati Pokharel**, Sunwoong Choi and Dai Soo Lee “The effect of hard segment length on the thermal and mechanical properties of polyurethane/graphene oxide nanocomposite.” *Composites Part A: Applied Science and Manufacturing* 2015,69,168–177.
- Hem Raj Pant, **Pashupati Pokharel**, Mahesh Kumar Joshi, Surya Adhikari, Han Joo Kim, Chan Hee Park and Cheol Sang Kim “Processing and characterization of electrospun graphene oxide/polyurethane composite nanofibers for stent coating.” *Chemical Engineering Journal* 2015,270,336–342.
- **Pashupati Pokharel**, Jung-gyu Lim, Kyoung Yong Lee and Sunwoong Choi “Effects of titanate treatment on morphology and mechanical properties of graphene nanoplatelets/high density polyethylene nanocomposites.” *Journal of Applied Polymer Science* 2015,132, 42073 **(Journal Cover)**.
- Bishweshwar Pant, **Pashupati Pokharel**, Arjun Prasad Tiwari, Mira Park, Soo-Jin Park, Prem Singh Saud, Zafar Khan Ghouri, Sunwoong Choi and Hak-Yong Kim “Characterization and antibacterial properties of aminophenol grafted and Ag NPs decorated graphene nanocomposites.” *Ceramics International* 2015,41,5656–5662.
- **Pashupati Pokharel**, Sang Hyub Lee, and Dai Soo Lee “Thermal, mechanical, and electrical properties of graphene nanoplatelets/graphene oxide/polyurethane hybrid nanocomposite” *Journal of Nanoscience and Nanotechnology* 2015,15,211-214.
- Do-Yeon Kang, **Pashupati Pokharel**, Yeong-Seok Kim, Sunwoong Choi and Seong-Ho Choi “Synthesis of metal oxide decorated polycarboxyphenyl polymer grafted multi-walled carbon nanotube composites by a chemical grafting approach for supercapacitor application” *Journal of Nanomaterials* 2015 (2015) Doi: 10.1155/2015/ 535319.
- **Pashupati Pokharel** and Dai Soo Lee “High performance polyurethane nanocomposites prepared from a masterbatch of graphene oxide in polyether polyol.” *Chemical Engineering Journal* 2014,253,356-365.

- **Pashupati Pokharel**, Quang-Trung Truong, and Dai Soo Lee “Multi-step microwave reduction of graphite oxide and its use in the formation of electrically conductive graphene/epoxy composites.” *Composites Part B: Engineering* 2014,64,187-193.
- **Pashupati Pokharel** and Dai Soo Lee “Thermal and mechanical properties of reduced graphene oxide/polyurethane nanocomposite.” *Journal of Nanoscience and Nanotechnology* 2014,14,5718-5721.
- Hem Raj Pant, Bishweshwar Pant, **Pashupati Pokharel**, Han Joo Kim, Leonard D. Tijing, Chan Hee Park, Dai Soo Lee, Hak Yong Kim, Cheol Sang Kim “Photocatalytic TiO<sub>2</sub>-RGO/nylon-6 spider-wave-like nano-nets via electrospinning and hydrothermal treatment.” *Journal of Membrane Science* 2013,429,225-234.
- Hem Raj Pant, Chan Hee Park, **Pashupati Pokharel**, Leonard D. Tijing, Dai Soo Lee, Cheol Sang Kim. “ZnO micro-flowers assembled on reduced graphene sheets with high photocatalytic activity for removal of pollutants.” *Powder Technology* 2013,235,853-858.
- T. Battumur, Swapnil B. Ambade, Rohan B. Ambade, **Pashupati Pokharel**, Dai Soo Lee, Sung-Hwan Han, Wonjoo Lee, Soo-Hyoung Lee “Addition of multiwalled carbon nanotube and graphene nanosheet in cobalt oxide film for enhancement of capacitance in electrochemical capacitors.” *Current Applied Physics*, 2013,13,196-204.
- Quang-Trung Truong, **Pashupati Pokharel**, GS Song, and Dai Soo Lee. “Preparation and characterization of graphite nanoplatelets from natural graphite via intercalation and exfoliation with tetraalkylammoniumbromide.” *Journal of Nanoscience and Nanotechnology* 2012,12,4305-4308.

## Conference Presentations

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- Pashupati Pokharel. Presentation title “***Graphene oxide-based polymer nanocomposites: current status and future perspectives***” in seminar on eco-materials for environment and energy applications at Sun Moon University, Asan, South Korea, Aug 22, 2015 (**Invited speaker**).
- Pashupati Pokharel, Jung-gyu Lim, Hak-Yong Kim and Sunwoong Choi. Presented poster entitled “***Effects of functional groups on the graphene sheet for improving the thermomechanical properties of polyurethane nanocomposites***” in 2nd International

Materials, Industrial & Manufacturing Engineering Conference (MIMEC2015), Bali, Indonesia, Feb 4-6, 2015.

- Pashupati Pokharel, Do-Yeon Kang, Sunwoong Choi and Seong-Ho Choi. Presented poster entitled “***Synthesis of metal oxide decorated polycarboxyphenyl polymer grafted multi-walled carbon nanotube composites by a chemical grafting approach for supercapacitor application***” in 2nd International Materials, Industrial & Manufacturing Engineering Conference (MIMEC2015), Bali, Indonesia, Feb 4-6, 2015.
- Pashupati Pokharel, Jung-gyu Lim and Sunwoong Choi. Presented poster entitled “***Enhancement of mechanical properties of high density polyethylene nanocomposites containing graphene nanoplatelets and titanate coupling agent***” in Kathmandu Symposia on Advanced Materials (KaSAM), Kathmandu, Nepal, Sept 7-10, 2014.
- Pashupati Pokharel. Seminar presentation on the title “***Structure-property relationships of graphene-based polyurethane nanocomposites***” at Hannam University, Daejeon, South Korea, Jan 7, 2014 (**Invited speaker**).
- Pashupati Pokharel, Sang Hyub Lee and Dai Soo Lee. Presented poster entitled “***Thermal and Mechanical Properties of Graphene Nanoplatelet/Graphene Oxide/Polyurethane Hybrid Nanocomposite***” in International Conference of Nanoscience and Nanotechnology (ICNST 2012), Photonics Technology Institute, Gwangju, South Korea, Nov 8-9, 2012.
- Pashupati Pokharel and Dai Soo Lee. Presented poster entitled “***Thermal and Mechanical Properties of Reduced Graphene Oxide/Polyurethane Nanocomposite***” The 23<sup>rd</sup> international conference on molecular electronics and devices ICME&D 2012 South Korea, Oct 15-17, 2012.
- Pashupati Pokharel and Dai Soo Lee. Presented poster entitled “***Adhesive properties of nanocomposites based on graphene oxide and polyurethane prepolymers***” in International Conference of Nanoscience and Nanotechnology (ICNST 2011), 70<sup>th</sup> Memorial Hall, Sunchon National University, Suncheon, Korea, Nov 10-11, 2011.
- Pashupati Pokharel, Dae Woo Lee and Dai Soo Lee. Presented poster entitled “***Effect of hard segment length on graphene oxide/polyurethane nanocomposite***” National Conference organized by Korean Polyurethane Society , DCC Daejeon, South Korea, Aug 18-19, 2011.

- Pashupati Pokharel, Dae Woo Lee and Dai Soo Lee. Presented an oral presentation entitled ***“Selective reinforcement of the hard segment of polyurethane with graphene oxide”*** in 18<sup>th</sup> International Conference on Composite materials (ICCM-18), ICC Jeju, South Korea, Aug 21-26, 2011.
- Dae Woo Lee, Pashupati Pokharel and Dai Soo Lee. Presented poster entitled ***“Curing behaviors and mechanical properties of thermoplastic vinyl ester graphite oxide nanocomposite”*** in 18<sup>th</sup> International Conference on Composite materials (ICCM-18), ICC Jeju, South Korea, Aug 21-26, 2011.
- Pashupati Pokharel, Kang Kiho, Dae Woo Lee, Quang-Trung Truong and Dai Soo Lee. Presented an oral presentation entitled ***“Effective reinforcement of polyurethane by using various graphene oxides of different oxidation and different size”*** in Polychar 19 Conference, Kathmandu, Nepal, Mar 20-24, 2011.
- Quang-Trung Truong, Pashupati Pokharel and Dai Soo Lee. Presented poster entitled ***“Preparation and characterization of graphene nanoplates from natural graphite via intercalation and exfoliation with tetraalkylammoniumbromide”*** in 21<sup>st</sup> International Conference on Molecular Electronics and Devices (ME&D 21), Suncheon National University, Suncheon, Korea, May 19-20, 2010.
- Pashupati Pokharel, Gwang Seok Song and Dai Soo Lee. Presented an oral presentation entitled ***“Rheology and Electrical Properties of epoxy resins filled with graphene nanosheets”*** in International Conference of Nanoscience and Nanotechnology (ICNST 2010), Oryong hall, GIST, South Korea, Nov 8-9, 2010.
- Pashupati Pokharel and Dai Soo Lee. Presented poster entitled ***“Preparation of graphene sheets from graphite and polymer nanocomposite of epoxy resin/ graphene sheets”*** National Conference of Korean Polymer Society, Daejeon, South Korea, Apr 9-10, 2009.

## References

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**Dr. Santosh Aryal**

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