

Rangika Thilan De Silva

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Educational Qualifications:

03/2012- 06/2015 - Doctor of Philosophy (PhD)
School of Engineering, Department of Mechanical Engineering
Monash University
Doctoral Thesis: Biopolymer nanocomposites for packaging applications

03/2008 - 11/2011 - Bachelor of Engineering (Honours) – Mechanical Engineering
Monash University, Malaysia
Honors Thesis: Reinforcing chitosan membranes with halloysite nanotubes

Awards & Honours:

- 12/2017** Session Best Presenter in 4th International Conference on Nanotechnology, Colombo.
- 03/2015** Received “Postgraduate Publication Award” from Monash University for outstanding publication track record.
- 03/2012** Received the Higher Degree by Research (HDR) Scholarship from Monash University, Malaysia to pursue postgraduate studies.
- 02/2012** Awarded 'The Institution Project Award' for the Final Year Thesis Project by the Institute of Mechanical Engineers (IMEchE) – Malaysia.
- 11/2011** Received the ‘Best Thesis Award (merit)’ for the Final Year Thesis Project by the Faculty of Mechanical Engineering, Monash University Malaysia.

Work Experience:

02/2018 - Current Head of Technology Transfer
Sri Lanka Institute of Nanotechnology (SLINTEC)

Summary of Duties:

- Overseeing the technology transfer division to plan and implement strategies to commercialize research carried out by SLINTEC.

09/2017 – Current Senior Lecturer
Sri Lanka Institute of Nanotechnology (SLINTEC) – Academy

Summary of Duties:

- Conducting lectures in the field of ‘Applications of Nanotechnology and Advance Materials’.

- Supervising PhD and MPhil students' research projects.

**08/2015 – 02/2018 Post-doctoral Researcher
Sri Lanka Institute of Nanotechnology (SLINTEC)**

Summary of Duties:

- Worked as the project leader for the following client projects and engaged in project planning and handling.
 - Client: Lina-Akbar Pharmaceuticals (Pvt) Ltd*
Developed a biopolymer-based active wound dressing material for chronic ulcers
 - Client: JF Packaging (Pvt) Ltd*
Developed a nano-clay-incorporated LDPE films with enhanced moisture and oxygen barrier properties for smart packaging applications.
- Currently working as a principal investigator and co-investigator of the first two NRC grants awarded to SLINTEC.
- Currently conducting Blue-sky research related to reinforced polymer nanocomposites for packaging, tissue engineering, automobile and water purification applications.

Research Areas & Interests:

- Polymer nanocomposites
 - Fabrication and characterization of biopolymer nanocomposites using melt compounding, extrusion, solution casting, electrospinning, injection molding and 3D printing
 - Utilizing nano-fillers (nano-clay, graphite and derivatives, CNTs) to reinforce polymers
 - Utilizing Halloysite nanotubes (HNTs) as a reinforcing filler and nano-container to introduce multifunctional properties into polymeric composites for end-user applications
 - Self-healing polymer composites
- Electrospinning of nano-fibers and polymer blends
- Functionalizing nano-fillers with coupling agents and metal oxides
- 3-D computational studies of nanocomposites based on finite element analysis

Research Publications

Refereed Journal Publications (Selected)

15 papers in total, 360 total Citations, H-index: 10, i10-index: 10

De Silva RT, Mantilaka PG, Dissanayake RK, Wijesinghe S, Weerasinghe L, Amaratunga GAJ, De Silva KMN. Drug-loaded halloysite nanotubes reinforced electrospun alginate-based nanofibrous scaffolds with sustained antimicrobial protection. *APPLIED MATERIALS & INTERFACES*. 2018

De Silva RT, Mantilaka PG, Ratnayake SP, Amaratunga GAJ, De Silva KMN. MgO nanoparticles reinforced chitosan nanocomposites for high performance packaging applications with improved thermo-mechanical properties. *CARBOHYDRATE POLYMERS*. 2017; 157: 739-747.

De Silva RT, Pasbakhsh P, Lee SM, Kit AY. ZnO deposited/encapsulated halloysite–poly (lactic acid) (PLA) nanocomposites for high performance packaging films with improved mechanical and antimicrobial properties. *APPLIED CLAY SCIENCE*. 2015;111:10-20.

De Silva RT, Pasbakhsh P, Goh KL. 3-D computational model of poly (lactic acid)/halloysite nanotube composites: Predicting elastic properties and stress analysis. *POLYMER*. 2014;55: 6418-6425.

Makaremi M, **De Silva RT**, Pasbakhsh P. Electrospun Nanofibrous Membranes of Polyacrylonitrile/Halloysite with Superior Water Filtration Ability. *THE JOURNAL OF PHYSICAL CHEMISTRY- C*. 2015;119(14): 7949-7958.

De Silva RT, Soheilmoghaddam M, Goh KL, Wahit MU, Bee SAH, Chai S-P, et al. Influence of the processing methods on the properties of poly(lactic acid)/halloysite nanocomposites. *POLYMER COMPOSITES*. 2014.DOI: 10.1002/pc.23244.

De Silva RT, Pasbakhsh P, Goh KL, Chai S-P and Ismail H. Physico-chemical characterisation of chitosan/halloysite composite membranes. *POLYMER TESTING*.2013; 32: 265-71.

Refereed Book Chapters:

De Silva RT, Pasbakhsh P, Goh KL. Research progress in natural mineral nanotubes. Chapter: Polylactide/halloysite nanotube composites. APPLE ACADEMIC PRESS. 2014.

Goh KL, **De Silva RT**, Pasbakhsh P. Research progress in natural mineral nanotubes. Chapter: Mechanics of halloysite nanotubes. APPLE ACADEMIC PRESS. 2014.

Fong TC, Saba N, Liew CK, **De Silva RT**, Hoque ME, Goh KL. Manufacturing of Natural Fibre Reinforced Polymer Composites. Chapter: Yarn Flax Fibres for Polymer-Coated Sutures and Hand Layup Polymer Composite Laminates. SPRINGER. 2015.

Conference Proceedings:

Madsen B, Lilholt H, Mannila J, De Silva RT, Pasbakhsh P. Volumetric composition of nanocomposites. 20th International Conference on Composite Materials (ICCM 20), Copenhagen, Denmark, July 2015.

De Silva RT, Pasbakhsh P, Goh KL. Prediction of elastic properties of polylactide/halloysite composites. 8th Australian Congress on Applied Mechanics (ACAM 8), Melbourne, Australia, Nov 2014. [Presented]

De Silva RT, Pasbakhsh P, Vahedi V. The role of halloysite's surface area and aspect ratio on the tensile properties of ethylene propylene diene monomer (EMPD) nanocomposites. 16th European Conference on Composite Materials (ECCM16), Seville, Spain, June 2014.

De Silva RT, Pasbakhsh P, Goh KL, Chai SP. Polylactide/clay nanocomposite films. 19th International Conference on Composite Materials (ICCM 19), Montreal, Canada, August 2013.

De Silva RT, Pasbakhsh P, Goh KL, Chai SP. Modeling of mechanical properties of membranes of chitosan/halloysite nanocomposites. 15th European Conference on Composite Materials (ECCM15), Venice, Italy, June 2012.

Editorial and Reviewer Duties:

Co-editor: Interfaces of Particle Reinforced Composites: Elsevier (to be published in Dec 2018)

Reviewed journal articles in Carbohydrate Polymers (2018), Clays and Clay Minerals (2015), Applied Surface Sciences (2017) and International Journal of Biomaterials (2017).

Reviewed a book chapter in "Applications, Research Progress in Natural Mineral Nanotubes", 2014.

Research Grants:

Water filtration	EPSRC - GCRF	Lead-collaborator	2017
Self-healing epoxy composites	NRC – Sri Lanka	Principal Investigator	2017
Synthesis of value-added products including nano-materials from Sri Lankan laterite for industrial applications	NRC - Sri Lanka	Co-investigator	2016

Participated Conference & Certified Workshops (Selected):

- Best presenter - 4th International Conference on Nanotechnology, Colombo.
- Presented at the 8th Australian Congress on Applied Mechanics, 2014 in Melbourne
- Member of the organizing committees of the conferences, “Asian-Australian Conference of Composite Materials” and “International Symposium of Advance Functional Material”

Skills Summary (Research):

- Expertise in polymer nanocomposite processing methods (melt compounding, extrusion, film blowing, solution casting, electrospinning), and reinforcing thermoplastics (PLA, PE, PVC, etc.), elastomers and thermosetting polymers using different nano-fillers (halloysite nanotubes, montmorillonite, metal oxide nanoparticles, etc.) for packaging, filtration, automobile and tissue engineering applications.
- Experience in surface modification of nano-clay (halloysite nanotubes and montmorillonite) with silane coupling agents and metal-oxides.
- Proficient in material characterization techniques such as tensile and impact testing, scanning electron microscopic imaging (SEM and FE-SEM), X-Ray diffraction, Nitrogen adsorption-desorption analysis, antimicrobial studies, contact angle, FTIR, TGA, DSC, etc.
- Expertise in predicting mechanical properties and analyzing fracture mechanism of polymer nanocomposites using finite element modeling.
- Experience in the use of computer aided design software (Solid Edge, Solid Works, INVENTOR and NX), Finite Element software (COMSOL and ANSYS Work Bench) and MATLAB.

Referees

Dr. Pooria Pasbakhsh

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