



BAMI Seminar – March 2016

Kirubanandan Shanmugam, PhD Student, BioPRIA/Department of Chemical Engineering

Friday 11th March 2016, 12.30PM to 1.30PM
Room G03, BioPRIA, 15 Alliance Lane (Building 59), Clayton Campus

Moderator: Praveena Raj, PhD Student, BioPRIA/Department of Chemical Engineering

Enhancing the barrier properties of the base sheet using a lab scale spray coating of Micro/Nano fibrillated cellulose

Abstract:

An excellent barrier property is a critical requirement for the development of many packaging materials. In order to meet this requirement, laminating aluminium with a base sheet and extrusion coating of synthetic organic polymers on the sheet are the conventional method to make barrier materials. However, the conventional process has many shortcomings such as cost expensive process, environmental disposal issue of aluminium laminated and synthetic polymers. Past decade, coating of various biopolymers with a base sheet is developed to enhance the barrier properties of a base sheet. Among many coating techniques, the spray coating is a novel one and has advantages such as the production of even coating surface in the base sheet and contactless coating with the substrate. This work explains a lab scale spray coating of Micro/Nano fibrillated cellulose on the base sheet and evaluated its barrier properties of the spray coated paper. A laboratory scale spray coating of different concentration of MFC (Micro fibrillated cellulose)/NFC (Nano fibrillated cellulose) on the base sheets using a domestic spray gun is developed and the spray coated paper is characterized by measuring its grammage, air and oxygen permeability, surface morphology using optical microscopy, tensile strength and surface roughness. The spray coating process leads to the formation of a continuous film that induces a drop in the air permeability of the brown paper substrate and increases the mechanical properties. The pilot scale process of spray coating process would be developed on a continuous scale using a Dow Web Coater with professional Wagner Spray system. The spray coated paper from a continuous process will be used as a packaging material and membranes for filtration.

Presentation and Q&A session will be from 12.30PM – 1.00PM. Lunch will be served at 1.00PM.

Enquires: BAMI Student Chapter coordinators Lionel Longe or Uthpala Garusinghe.

Jinhuo Dai, PhD Student, BioPRIA/Department of Chemical Engineering

Friday 22nd March 2016, 12.30PM to 1.30PM

Room G03, BioPRIA, 15 Alliance Lane (Building 59), Clayton Campus

Moderator: Lionel Longe, PhD Student, BioPRIA/Department of Chemical Engineering

Abstract:

Lignin depolymerisation with two chemical methods are studied. Firstly, copper and N-based ligands as catalyst was used to depolymerise lignin ionic liquids. The molecular weight of lignin was decreased from 12000 to 2000. The redox potential of copper coordinating with different ligands was studied. Secondly, oxidised lignin depolymerisation in formate ionic liquids was investigated. β -O-4 bonds type lignin model compound was synthesised to confirm different oxidation with several oxidation catalyst systems. Also the screening reaction for different lignin samples were carried out.

Presentation and Q&A session will be from 12.30PM – 1.00PM. Lunch will be served at 1.00PM.

Enquires: BAMl Student Chapter coordinators Lionel Longe or Uthpala Garusinghe.