

Development of Starch-based Materials

By Professor Long Yu

Host: Prof. Zhou Weibiao **Date:** 17th May 2016, Tuesday
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Abstract

The development and production of biodegradable starch-based materials have been spurred by oil shortages and the growing interest in easing the environmental burden of petrochemically derived polymers. Furthermore, the unique microstructures of different starches and their multiphase transitions during thermal processing can be used as an outstanding model system to illustrate our conceptual approach to understand the structure–processing–property relationships in polymers. Various conventional processing techniques such as extrusion, injection compression molding, and casting, as well as some new techniques such as reactive extrusion, have been adapted for processing starch-based polymers. In order to overcome disadvantages pure starch-based materials have, such as poor mechanical properties found in natural polymers; or the high price of synthetic polymers, various blends and composites have been developed in the last decade. The starch-based materials reinforced with natural fibres and nano-particles have been developed to various environmentally friendly composites. The hydrophilic properties of starch provide the advantage of compatibility with cellulose and nano clay. Compatibilizers and the technology of reactive extrusion have been used to improve the interface between natural and synthetic polymers. Various starch-based products have been developed and commercialized.

Examples of commercialized products of starch-based materials.



About the speaker



Professor Long Yu has just been appointed as Director of Sino-Singapore International Joint Research Institute located in Guangzhou, China. He used to work in CSIRO, Australia as Principal Scientist for more than 20 years. Prof Yu has had more than 130 SCI papers published and citation time is more than 5000. He has been selected as a Fellow of Royal Australian Chemical Institute in 2002, and currently been pointed as Editorial Board of 6 SCI journals. In the last 20 years, Prof Yu has been working on various polymeric materials from renewable resources. He has successfully developed and commercialized many starch-based materials and products.