



RECENT ADVANCES ON STARCH-BASED NANO-BIOCOMPOSITES

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Monday 8th September 2008, 11:00 a.m. – 12:00 noon
Engineering Lecture Theatre E7

New sustainable development policies and increasing awareness of the plastics waste issue require the development of new environmentally friendly materials. Biopolymer based-materials (biodegradable and/or biocompatible polymers) are an elegant solution to replace conventional non degradable petroleum-based products for short term applications. Starch is an inherently biodegradable and renewable material which can be plasticized with water and polyols to obtain a “green” and processable plastic. Nevertheless, water sensitivity and low mechanical properties compared to conventional thermoplastics have to be overcome. Nano-biocomposite which is a combination of a biopolymer with nanofillers could be an innovating answer to decrease these drawbacks. Depending on the nanofillers geometry and nature, new and/or improved properties are obtained. The most intensive researches are focused on nanoclays (e.g. montmorillonite) due to their availability, versatility and respectability towards the environment. The main interest of these nanofillers is that small amounts (< 5 wt%) are required to improve the properties as a result of the huge area interface of the clay platelets. To obtain such a result, the nanoplatelets stacks have to be disaggregated (exfoliation) and homogeneously dispersed into the biomatrix. The aim of this study is to characterize and control the nano-structuration to enhance and tune the final starch-based nano-biocomposite properties.

Professor Avérous is co-director and projects leader in the Laboratory of Engineering Polymers for High Technologies (LIPHT-UMR CNRS) of University Louis Pasteur (Strasbourg-France). He graduated from the High Polymers Application School (EAHP-France). He obtained his PhD in science and polymer engineering from School of Mines of Paris in 1995. After different post-doctoral positions, he was Associate Professor at the Packaging Engineering School of Reims (ESIEC-France) and became full Professor in 2003. During the last twelve years, his major research projects have dealt with multiphase systems (blends, multilayers, composites and nanocomposites) based on agro-resources (starch, lignins, cellulose) and biopolyesters (PLA, PHA). He has been particularly involved in the study of materials-process-properties relationships. He has contributed to several international papers, books chapters and patents. He also teaches in biopolymer, biomaterial, plastic processing and polymers characterization in the European Engineering School of Chemistry, Polymers and Materials (ECPM) of Strasbourg.

Visitors are most welcome: Please note the parking arrangements. There is a designated Visitors Car Park (N1) clearly ground-marked by white paint and tickets, at a cost of \$3/day, are available from a dispensing machine. ('Blue' permit designated areas are for Monash members only.). It is also possible to park at other designated Visitors Car Parks (E1, S1 and S2) on the Clayton Campus, but tickets are \$1.4/hour.

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