University of Western Sydney

Research Directions

Office of Research Services

Searching with Synchrotron

Dr Nguyen Tran, School of Natural Sciences has received funding from the Australian Synchrotron Research Program to investigate the atomic-scale structures of polymer-clay nanocomposites.

Polymer-clay nanocomposite materials are light-weight and cost-effective with many applications such as coatings, packaging and high-performance composites for use in aircrafts. Their replacement of metals in the automotive coating applications has initially been developed by Toyota Motor Company (see Figure 1). They are mixed at the nanometer scale, which is a metric unit of length equal to one ten billionth of a metre. Synchrotron radiation is a very powerful light source that allows probing the structures of the materials at the molecular and atomic levels.

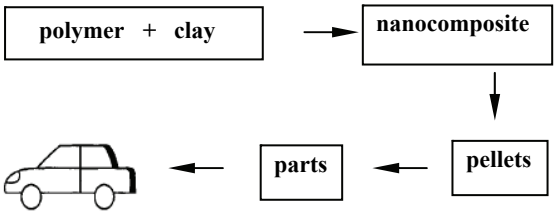

Figure : *Schematic of the applications of the polymer - clay nanocomposites in automotive coating industry*

'The project is significant because it will allow us to examine the short range structural order of the clays that influence the properties of the polymer-clay nanocomposites.' Dr Tran explained. 'This will allow greater understanding of the correlation between the atomic scale structures of the polymer and clay and encourage further synchrotron research from the chemists, physicists and material scientists at UWS'.

In 2002, the Australian Research Council classified synchrotron radiation as one of the National Research Priorities. At present Australian synchrotron facilities are located in Taiwan, USA and Japan, however, from 2007 Australian national synchrotron facilities will be available at Monash University.

Project Title: *Molecular Orientation of Alkyl Ammonium on Layered Silicate of Montmorillonite*

Funding has been set at $4,230.00.

Contact Details

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Relevant Web Sites:

http://www.uws.edu.au/about/acadorg/colleges/healthandscience
http://www.ansto.gov.au/natfac/index.html