

Under the Industrial PhD Programme (IPP) framework initiated by Economic Development Board Singapore, TUM Asia and Resin & Pigment Technologies Pte Ltd have partnered to embark on their first research project. This project aims to also provide postgraduate training in a corporate research and development environment where suitable candidates will be offered opportunities to conduct research and pursue PhD conferred by TUM with support from the Singapore government.

Details of the programme:

Duration:	4 years (no bonds required after the completion of the project)
Remuneration:	Up to SGD3,300 (neg) per month with CPF contribution and AWS
Application Criteria:	Singaporeans and PRs ONLY. Minimum education qualification – Master degrees holder
Supervising Professor:	Prof. Fritz Kühn (Head of Molecular Catalysis, TUM)
Company attached to:	Resin & Pigment Technologies Pte Ltd http://www.resinpts.com
Project Title:	Organic/Inorganic Transparent Thermoplastic Nano-composites

Abstract

The incorporation of inorganic nano-particles into polymer based materials allows one to couple properties associated with the inorganic phase to polymers, leading to new functionality of the polymer based materials or new processing methods for inorganic materials. During the preparation of organic/inorganic nano-composites, the key issue is the dispersion of nano-particles as these nano-scaled fillers possess large specific area and high surface energy leading to high tendencies in agglomeration of the nano-particles in organic polymeric matrices. Such dispersion issues generally lead to reduction in optical clarity and other intended functional properties of the nano-composites. Many efforts have been made to resolve this problem through sol-gel blending technique, melt blending process, in situ polymerisation process, and in situ forming nano-particles process. In this work, the melt blending process which is the simplest and most economy approach for the production of thermoplastic nano-composites will be adopted for the dispersion of nanoparticles in transparent polymeric matrices. The effects of surface treatment on the nanoparticles with organic functional groups, incorporation of organic dispersing aids and compounding conditions on the dispersability of the fillers in several transparent polymeric matrices will be investigated. The organic/inorganic nano-composites produced will be assessed for the suitability in UV/IR shielding thin film applications.

At the end of the project, upon submission of his/her PhD thesis and successful defence of his/her thesis, the candidate will be conferred his/her post-doctorate by TUM.

Interested applicants, kindly submit your latest resume to gary.ong@tum-asia.edu.sg by 30th November 2013.