SUONG V. HOA

Dr. Suong V. Hoa is a professor at the Department of Mechanical and Industrial Engineering at Concordia University. He is also Director of Concordia Center for Composites, and Co-Director of the Center for Research on Polymers and Composites (CREPEC) (funded by FQRNT). Dr. Hoa was chair of the Department of Mechanical and Industrial Engineering at Concordia from 1994-2000 and from 2003-2006.

Dr. Hoa started working on polymer composites since 1979 and he started work on polymer composites using nanoparticles since 2000. He has published more than 500 articles in scientific journals and conferences, and 4 books. He has collaborated closely with many companies in Quebec, other provinces in Canada and in other countries These collaborative works have resulted in several patents.

Dr. Hoa is the recipient of many awards and prizes. These include the Society of Automotive Engineers Ralph R. Teetor award (1980), Fellow of the American Society of Mechanical Engineers (1996), Fellow of the Canadian Society for Mechanical Engineering (CSME) (1996), CSME G.H. Duggan medal on Advanced Materials (1996), Natural Sciences and Engineering Research Council of Canada Synergy award (2006), Association des Directeurs de Recherche Industrielle du Quebec (ADRIQ) partenariat award (2006), Fellow of Engineering Institute of Canada (2007), Nanoquebec NanoAcademia prize (2008) and Pratt & Whitney Research Fellow (2008).

Polymer Composites with Nanoparticles

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Results of work on the development of polymer composites with nanoparticles are presented. Two types of nanoparticles have been used: nanoclays and carbon nanotubes. These particles have been incorporated into epoxy resins. Significant improvements on the properties of these resins have been obtained.

The incorporation of nanoclays results in augmentation of fracture toughness (about 6 times), improvement in resistance against fire, and improvement in resistance against water absorption or absorption of small molecule liquids. The nanoclay modified epoxies have also been incorporated into long carbon fibers. Laminates using these materials also show significant improvement in fracture toughness. A few applications for these materials can be for aircraft composites (enhanced fracture resistance, resistance against fire and resistance against absorption of water or small molecule fluids), epoxy for electrical insulation (resistance against cracking for big blocks of epoxy).

The incorporation of carbon nanotubes into epoxies results in significant augmentation of electrical conductivity. This enhanced increase in electrical conductivity in turn improves the Electro Magnetic Interference (EMI) shielding effectiveness of the polymeric material. A few applications for these materials can be for conductive adhesive joints, aircraft E3 (Electrical conductivity, Electromagnetic interference and Electrostatic discharge (lightning protection)).