

## **Toughening strategy and functional properties of geopolymer and rigid hybrid resin**

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This presentation briefly introduces some of our group's research efforts on network polymers. Selected examples highlighted for more detailed discussion include geopolymers and rigid silicone resins with extremely high crosslink density. Traditionally geopolymer has been studied as 'green cement' for applications for building construction. Our group took a molecular level approach and viewed geopolymer as an analogue to polymer resins with a completely inorganic chain structure. Our intention is to use geopolymer as matrix materials for lightweight composites including nanocomposites. Both mechanical and functional properties are discussed with the examples of syntactic foams and self-sensing nanocomposites. A unique strategy will also be proposed to substantially enhance the toughness of the inherently brittle geopolymer. Toughening strategy for organic-inorganic hybrid resins will also be discussed if time permits.

### Brief Biodata of the Speaker

Prof Xiao (Matthew) Hu is a professor of Materials Science and Engineering at the Nanyang Technological University (NTU) in Singapore. He obtained his Bachelor of Engineering from Tsinghua University, and later gained his MSc and PhD from the University of Manchester. He joined NTU in 1992 as one of the founding members of its materials programme, which has since emerged as one of the global leading Schools in the field. His own research group pursues studies of the underlying principles for design, synthesis and processing of advanced materials for targeted end uses. Prof Hu has contributed to more than 350 peer reviewed journal papers and more than 20 patent inventions.

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