

Improved mechanical properties through engineering the interface by poly (ether ether ketone) grafted graphene oxide in epoxy based nanocomposites

Prajakta Katti
Suryasarathi Bose, S. Kumar
Department of Materials Engineering, Indian
Institute of Science Bangalore-560012,
Karnataka, India

prajaktak@iisc.ac.in
prajaktakatti@gmail.com

Abstract

In this work, hydroxylated HPEEK [poly (ether ether ketone)] was covalently grafted on to graphene oxide (GO) sheets and methodically characterized using FTIR, TEM and XPS. The epoxy composites with GO and HPEEK grafted graphene oxide (HPEEK-g-GO) were prepared using mechanical stirring coupled with a bath sonicator to improve the dispersion and were subsequently cured at 80 °C and 180 °C.[1-4] With the addition of only a small amount (0.5 wt%) of HPEEK-g-GO, an impressive 42% increase in storage modulus, 65% enhancement in hardness and 31% increase in fracture toughness was observed with respect to the control epoxy sample. In addition, significant enhancement in tensile strength by 7 % was realized in epoxy composites containing 0.5 wt % of HPEEK-g-GO. This improvement in structural properties was attributed to reinforcement by HPEEK-g-GO having

sound interface with epoxy. The epoxy composites containing HPEEK-g-GO also showed improvement in glass transition temperature along with the thermal stability up to 300 °C.

References

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Figures

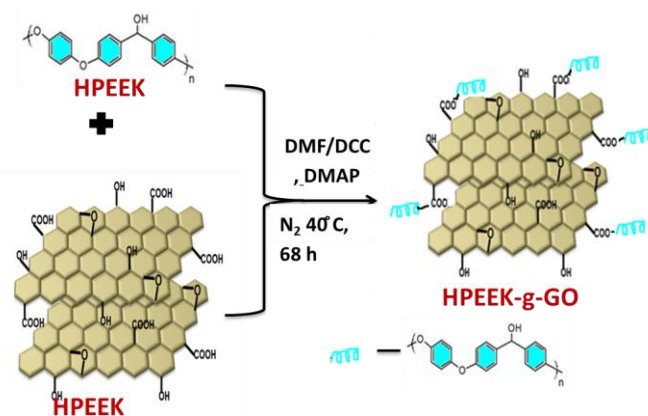


Figure 1: Schematic of grafting of HPEEK on graphene oxide