Journal of Applied Polymer Science / Volume 140, Issue 38 / e54447

RESEARCH ARTICLE

Structure, thermal, hydrophobic, and dielectric properties of Bermuda grass ash bio-silica, SBA-15, and rGO-reinforced bisphenol-BA-based polybenzoxazine composites

Harinei Srinivasan, Jeyameena Krishnan, Hariharan Arumugam, Alagar Muthukaruppan

First published: 18 July 2023
https://doi.org/10.1002/app.54447
Citations: 1

Abstract

The present work deals with the development of bisphenol-BA based benzoxazines and to study their behavior toward utilization for thermal, high-dielectric, low-dielectric, and anti-corrosion applications. A new type of bifunctional benzoxazine resins were synthesized using bisphenol-BA with different types of amines and characterized using FTIR, ^{1}H-NMR spectra, DSC, and TGA techniques. In the present study, thermally stable bisphenol-BA with trifluoromethylaniline benzoxazine (BBA-tfma) and bisphenol-BA with furfurylamine benzoxazine (BBA–ffa) were selected as matrices for the preparation of composites with SBA-15, bio-silica (from Bermuda grass) and reduced graphene oxide. The results indicated that the poly(BBA-tfma) with 5 wt% SBA-15 composites and poly(BBA-ffa) with 10 wt% bio-silica composites showed the lowest dielectric constant value of 1.71 and 1.87, respectively. While in contrast, the 5 wt% of reduced