

Efek Penambahan Graphene Oxide terhadap Sifat Mekanik Panel Komposit Lamina Epoksi/Serat Kenaf = The Effect of Graphene Oxide on the Mechanical Characteristic of Kenaf Fiber/Epoxy Laminated Composite

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Abstrak

Industri otomotif membutuhkan material alternatif yang ringan, kuat, dan ramah lingkungan untuk meningkatkan efisiensi bahan bakar dan mengurangi dampak lingkungan. Penelitian ini bertujuan untuk menentukan sifat mekanik komposit lamina epoksi berpenguat serat kenaf dan graphene oxide (GO). Serat kenaf dialkalisasi dengan larutan NaOH 5% dan disusun secara searah, sedangkan epoksi dicampur dengan GO dalam fraksi berat 0,5 wt%; 0,75 wt%; dan 1 wt%. Komposit difabrikasi menggunakan metode hand lay-up diikuti dengan vacuum bagging. Pengujian mekanik komposit meliputi uji tarik dan uji three-point bending. Karakterisasi GO meliputi analisis Fourier Transform Infrared Spectroscopy (FTIR) dan X-Ray Diffraction (XRD), serta pengamatan morfologi menggunakan mikroskop optik. Komposit epoksi berpenguat serat kenaf dengan kandungan GO 0,75 wt% menunjukkan sifat mekanik terbaik, yaitu 64,21 MPa dan 97,38 MPa, masing-masing untuk kuat tarik dan kuat lentur.

.....The automotive industry requires alternative materials that are lightweight, strong, and environmentally friendly aiming to improve fuel efficiency and reduce environmental impact. This research aimed to determine the mechanical properties of epoxy reinforced by kenaf fiber and graphene oxide (GO) composites. Kenaf fibers were treated with a 5% NaOH solution and arranged unidirectionally, while the epoxy was mixed with GO in weight fractions of 0.5 wt%; 0.75 wt%; and 1 wt%. The composites were fabricated using the hand lay-up followed by vacuum bagging method. Mechanical testing included tensile test and three-point bending test. GO characterization included Fourier Transform Infrared Spectroscopy (FTIR) and X-Ray Diffraction (XRD) analysis, as well as morphology observation using an optical microscope. The epoxy reinforced by kenaf fiber with 0,75 wt% GO exhibited the best mechanical properties, namely 64.21 MPa and 97.38 MPa for tensile strength and bending strength respectively.