

## Investigation of Alfa Fibers Reinforced Epoxy-Amine Composites Properties

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**Abstract :** The main goal of this study is the investigation of alfa fiber content, treated with alkali treatment, on the thermal and mechanical properties of epoxy-amine matrix-based composites. The fibers were treated with 5% of sodium hydroxide solution and varied between 10% to 30% weight fractions. The tensile, flexural, and hardness tests are carried out to investigate the mechanical properties of composites. The results show those composites' mechanical properties are higher than the neat epoxy-amine. It was noticed that the alkali treatment is more effective in the case of the tensile and flexural modulus than the tensile and flexural strength. The decline of both the tensile and flexural behavior of all composites with the increasing of the filler content was due probably to the random dispersion of the fibers in the epoxy resin. The Fourier transform infrared (FTIR) was employed to analyze the chemical structure of epoxy resin before and after curing with amine hardener. FTIR and DSC analysis confirmed that epoxy resin was completely cured with amine hardener at room temperature. SEM analysis has highlighted the microstructure of epoxy matrix and its composites.

**Keywords :** alfa fiber, epoxy resin, alkali treatment, mechanical properties

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