The Effects of Chemical Erosion on the Physical Properties of Natural Fiber Reinforced Composite Matrices

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As plastic pollution worsens, companies have begun searching for green plastics that last long but degrade naturally. Natural fiber composites, when paired with biodegradable resins like epoxy or silicone, offer a promising solution. This study examines moisture absorption and mechanical strength degradation in hemp fiber-reinforced epoxy composites versus fiberglass under varying pH conditions. Absorption profiles were created, percent absorption calculated, and linear regression models applied to assess moisture absorption rates. Results show hemp composites absorb significantly more moisture due to their hydrophilic nature. While hemp composites degrade faster than fiberglass in neutral and acidic environments, they show resistance in alkaline conditions, suggesting potential durability in basic corrosion settings. These findings highlight applications in construction projects, alkaline-prone areas, and sewage reclamation systems. Overall, hemp composites have proven to be a potentially cost-effective, durable alternative. This research lays the foundation for further exploration of hemp fiber-reinforced composites in sustainable industries.

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