

Studies on the mechanical and absorption properties of *achatina fulica snail* and eggshells reinforced composite materials

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Abstract:

The present study focuses on the mechanical and absorption properties of composites reinforced by *achatina fulica snail* (S-shell) and eggshell particles (E-shell). Epoxy composites of snail and eggshell particles were prepared separately with the filler content ranging from 5 to 20% by weight. Hybrid composites of both fillers were also prepared and assessed. Specimens of the composites and hybrid composites with different percentage weights of the reinforcing materials were fabricated using the resin casting method. Mechanical properties such as tensile strength, Young's modulus, impact strength, hardness and water absorption properties of the specimens were evaluated experimentally. It was observed that the addition of shell particles improves the mechanical properties of neat epoxy irrespective of the percentage weight of the reinforcement. The mechanical and water absorption properties of composites and hybrid composites varied depending on the amount of the reinforcement. Significantly, hybrid reinforcement by S-shell and E-shell particles offered superior properties in most cases. High percentage weight of calcium carbonate in these naturally sourced fillers and the synergistic effect of the S-shell and E-shells particle fillers can be attributed to high strength, stiffness, and decrease in water uptake of the composites.