Mechanical properties improvement of epoxy composites by natural hydroxyapatite from fish scales as a fillers

ABSTRACT

This study was carried out to prepare epoxy/natural hydroxyapatite composite for potential biomedical application. Natural hydroxyapatite (nHAp) powder was extracted from Tilapia fish scales via the thermal method. The natural hydroxyapatite was milled for 48 hours and dried by spray method. The nHAp particle size was determined using mastersizer 2000 particle size analyser and the chemical structure was confirmed using (XRD) and FTIR analysis. The particle size of nHAp was identified to be between 1 and 10 mi-crons. Mechanical properties of epoxy/natural hydroxyapatite were investi-gated by using impact and flexural test. The highest flexural strength of epoxy/nHAp composite was recorded when the nHAp filler was 10 wt% which is 77 % increment as compared to epoxy alone. The impact strength was increased up to two-fold as comparedto neat epoxy. The scanning elec-tron micrograph (SEM) and EDX analysis showed uniform dispersion of nHAp particles within the epoxy matrix for the composites with 10 wt% filler loading.

Keyword: Mechanical properties; Epoxy; Hydroxyapatite; Fish scales; Filler