EFFECT OF SEA CRAB (*CALLINECTES AMNICOLA)* SHELL REINFORCEMENT ON HIGH DENSITY POLYETHYLENE COMPOSITE

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Abstract (300 word limit)

The use of environmental friendly materials that are renewable plays a valuable role in reinforcement as natural filler. This study examined the effect of using sea crab shell particles as reinforcing material with high-density polyethylene (HDPE). The composites were produced by varying the sea crab shell particles of 10, 20 and 30 wt. %. The physical and mechanical properties of the reinforced HDPE as well as the elemental composition were developed. The result showed that pulverized sea crab shell filler contain Ca, Al, Si and Fe as the major constituent while Mg, P_2, Ti, K_2, and Na_2 were seen in traces. The density of the composite was observed to increase from 0.95 to 1.1091g/cm^3 as the filler content increased from 10 to 30 %. The water absorption showed minimal variation, while the tensile strength obtained increase from 15.36 to 17.91 MPa at 10 % loading of the filler, and then decreased until 30 % loading. The young modulus increases throughout the loading while the percentage elongation tends to decrease. Furthermore, the flexural strength increased though the best result was obtained at 20 %. The obtained results of the developed composites showed that sea crab shell waste is a viable, biodegradable and eco-friendly reinforcement for polymer-matrix composite.

Recent Publications (minimum 5)

1. Asipita, A.S., Ismail M., Majid M.Z.A, Majid Z.A., Abdullah C., Mirza J. (2014). Green Bambusa Arundinacea leaves extract as a sustainable corrosion inhibitor in steel reinforced concrete. Journal of Cleaner Production, Vol. 67, pp. 139-146.
2. Oboh, J. O.; Okafor, J.; Kovo, A.S.; Abdulrahman A.S. (2017) investigation of composites of natural rubber reinforced with eco-friendly cellulosic nanoparticles.Nigerian Journal of Technology (NIJOTECH). 1-14.
3. Kobe, H.I.; Abdulrahman, A.S.; Ismail, M.; Mohammed, I.A. (2017). Corrosion Inhibition and adsorption characteristics of camel foot leaves extracts on mild steel in HCL solution. Nigerian Journal of Technological Research. 12(1): 22-31
4. Agava A.R.; Muriana R.A; Abdulrahman A.S.; Egbe E.A.P; Thomas D.G. (2016). Determination of Chemical, mineralogical composition and liberation size of ochokochoko Iron ore, Kogi State Nigeria. Nigerian Journal of Engineering. Vol. 23 No. 1. 77-86.
5. Abdulrahman A.S. and Umeliwu A.O. (2016) Effect of pulverized snail (*Achantina fulica*) shell reinforcement on the mechanical properties of high density polyethylene composite. Nigeria Journal of Engineering and Applied Sciences. Vol. 3 No. 1. 96-104.



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