

Nanoparticles are materials that have diameter/dimension between 1 and 100 nm. The term also covers materials as high as 500 nm in diameter or length. Their emergence has given birth to a new set of nanocomposites with more promising properties than the conventional composites. Moreover, polyethylene products generate wastes. Their managements can create wealth and reduce dependence on the virgin polyethylene for green material productions. In this study, Delonix regia pod and eggshell hybrid nanoparticles, up to 12% (by wt), were incorporated into the low-density polyethylene. Properties of the developed hybrid nanocomposites were investigated and compared with those of the existing automobile dashboard cover material properties in literature. Results obtained from mechanical examinations show 332.77, 179.19, 807.32, 63.61, 4.33, 26.61 and 21.35% increases in tensile strength, percentage elongation, tensile modulus, flexural strength, flexural deflection, flexural energy absorbed and hardness, respectively; with consequent reductions in the flexural modulus and impact energy by respective 4.67 and 4.40% at 4% Delonix regia pod, 6% eggshell particles addition to the virgin low density polyethylene. Maximum impact energy of 25.09 J equal to 16.48% increase was noticed at 4% Delonix regia pod 4% eggshell particle addition to the recycled low-density polyethylene. Virgin low-density polyethylene containing 4% Delonix regia pod, 6% eggshell particles having greater tensile strength and impact energy than each of the existing materials for the automobile dashboard cover is confirmed suitable for both upper and lower layers of the dashboard cover. Hence, 4% Delonix regia pod 6% eggshell particles reinforced virgin low-density polyethylene has 28.39 ± 1.42 Nmm⁻² tensile strength; 1137.42 ± 15 Nmm⁻² tensile modulus; $6.24 \pm 0.68\%$ tensile elongation; 21.86 ± 0.9 J impact energy; 69.17 ± 3.51 VHN hardness value; 28.11 ± 0.84 Nmm⁻² flexural strength; 7.42 ± 0.8 flexural deformation; 314.41 ± 20.53 Nmm⁻² flexural modulus and 0.30 J flexural energy.