

DEVELOPMENT OF OPTIC SOLID LARGE CORE LIGHTING CABLE FROM KERATIN PROTEIN OF WASTE CHICKEN FEATHERS: AN INNOVATION IN FIBER OPTICS TECHNOLOGY

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ABSTRACT

Optic fiber lighting cables are installed on pools, fountains and lighted pathways for emergency routes and stairway steps. However, these lighting cables are very hard, expensive and not locally fabricated. Thus, the researchers were motivated to produce a cost effective lighting cable using the keratin of waste chicken feathers. The keratin was extracted from chicken feathers to develop an optic solid large core lighting cables using chemical reagents. Then, Biuret test was performed to confirm the presence of keratin protein. After which, the optic solid large core lighting cable was fabricated using the varying ratios of keratin solution (0.15 mL, 0.25 mL, 0.35 mL), hardener and resin in the different setups. Then, the qualities of the lighting cables were evaluated in terms of their absorbance, transmittance, flexibility, impact resistance, luminous emittance and water absorbance. Biuret test confirmed the presence of keratin from chicken feathers. Result showed that the amount of keratin in the optic solid large core lighting cables is directly proportional to its transmittance, impact resistance, and luminous emittance but inversely proportional to its absorbance, flexibility and water absorbance. This implies that the higher the amount of keratin, the higher is its ability to transmit and emit light and the lower is its chances of deteriorations and deformations which are very important characteristics of the optic solid large core lighting cable. Scheffe test also revealed that the keratin from chicken feathers significantly increased the transmittance and luminous emittance and significantly decreased the absorbance, flexibility and water absorbance of the lighting cable as compared to the control group (hardener and resin only).

Keywords: Chicken feathers; keratin; optic solid large core lighting cable.