

Development of Porcelain Insulator using locally available raw materials from Edo state, Nigeria

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Abstract

In power systems, there is an ever-increasing demand placed on porcelain insulators, especially for outdoor applications. More so, the massive cost of importation has resulted in a growing need for local manufacture. To this end, production of an electrical porcelain insulator from locally sourced raw materials from Edo state, Nigeria is imminent. The study adopted body formulation from previous research since the onus of the study was to investigate the effect of pressure on the composition as it improves the electrical porcelain insulator. Samples were produced and compressed at varying pressures of 10kN, 20kN, 30kN, 40kN, and 50kN. X-Ray Diffractometer was used to determine the mineralogical compositions of the raw materials. Samples produced were subjected to physical property tests using American standard for Testing and Materials (ASTM C20-00), Automatic Digital Machine (ADR-1500) was used to determine the compressive strength of the samples. Also, hipotronic and KEW 3125A High Voltage Insulation tester were used to characterize the electrical property of samples produced. However, the mechanical strength was given priority rather than dielectric breakdown; this is because, dielectric strength is generally sufficient, but most high voltage transmission insulators are subjected to significant tensile strains in service and have a tendency to fail mechanically. Sample compounded with 20kN had the highest mechanical strength of 17.30 N/mm² and was considered suitable for the production of shackle insulators.



Biography:

Ologunwa Temitope P. (Ph.D) had a Bachelor of Technology (B.Tech) and a Master of Technology (M.Tech) degrees in Industrial Design (Ceramics Option), and PhD in Ceramics. He is currently a Lecturer I at the Department of Industrial Design, School of Environmental Technology, Federal University of Technology, Akure, Nigeria. He lectures both undergraduate and postgraduate students in Ceramics courses at different levels for

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Speaker Publications:

1. Ologunwa, Temitope. (2020). Process and Development of Electrical Porcelain Insulator Using Edo State, Nigerian Raw Materials. International Journal of Engineering and Manufacturing. 10.43-55. 10.5815/ijem.2020.03.04.

6th International Conference on Ceramics and Composite Materials; Webinar- June 08-09, 2020.

Abstract Citation:

Ologunwa Temitope, Development of Porcelain Insulator using locally available raw materials from Edo state, Nigeria, Ceramics 2020, 6th International Conference on Ceramics and Composite Materials; Webinar-June 08-09, 2020

(<https://ceramics.insightconferences.com/abstract/2020/development-of-porcelain-insulator-using-locally-available-raw-materials-from-edo-state-nigeria>)