

Figure : SEM Micrograph and EDS pattern for Sample B₂S

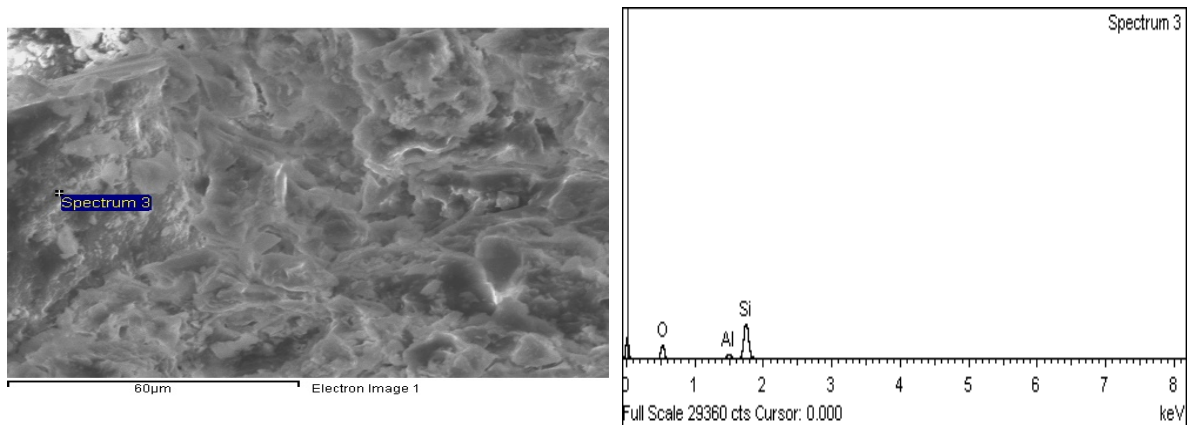


Figure : SEM Micrograph and EDS pattern for Sample B₃S

5. Conclusion

The present study investigated the effect of starting particle size of materials that enhance the mechanical and dielectric properties of porcelain insulator. The mix proportion of 30% wt. kaolin, 15 % wt. clay, 30% wt. feldspar, and 25% wt. of quartz at starting particle size powder of 75µm possesses the best mechanical and dielectric strength properties of all the samples. The mix proportion shows the compressive strength of 25.67kN where the required specification for shackle insulator is 15-16kN. The insulation resistance is 1.76GΩ at the injection of 1000 DC voltage while the required minimum insulation resistance is 500MΩ. It also has dielectric strength of 7.9kV/mm at leakage current >5.0mA.

However, this study suggests that 150µm particle sizes as a starting powder for production of electrical porcelain Insulator could also be used since mechanical and dielectric strength properties of samples produced with 150µm is also within the recommended value. This would eventually cut down the cost of processing raw materials before usage, and thereby reduce cost of production.

The result obtained from the XRD conducted on the mineralogical composition of the raw materials from Edo State, Nigeria proves its viability for electrical porcelain insulator production for any prospective

industry to set up her company in Edo state, Nigeria rather than relying on importation of this product. This study recommends raw materials from Edo State suitable for the production of shackle insulator and prospective porcelain insulator industry could establish in this state, considering proximity to available raw materials in order to cut down cost of transporting raw materials.

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Appendix

A1. Prototype of Shackle Insulators produced from this study



Author(s) Profile



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