Evaluation of Powdered Insulators for High Voltage Applications

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Purpose of the project: The purpose was to find a powdered chemical compound that was a respectable electrical insulator to replace other more traditional insulators. The powders are to be non-toxic, more environmentally friendly than current transformer oils and gases while still being more cost effective and environmentally friendly. Due to it also being a powder it will be far easier to remove for maintenance and can be easily replaced. Procedure/Method: The powdered compound was loaded into a plastic cylinder, which was then slightly compressed between two brass electrodes to remove air pockets. A high AC voltage potential was then applied to the two electrodes until electrical breakdown of the sample occurred. Data/Results: At first the results where unfavourable, having a breakdown voltage of below the breakdown voltage of air. After investigation it was determined that the setup design was the reason for the unfavourable results. After the powder was slightly compressed, with better electrode design, the results greatly improved. The finding is that powdered insulators are possible. Due to the equipment, there were a few uncontrollable facts that had a large effect on the results. Conclusion: Over all the powders performed better than air and in future can be used as a replacement option. The results should not be taken as definite values due to the lack of equipment and accurate hardware. These powders would be a great replacement for enclosed high voltage systems, primarily in systems that need to be worked on periodically.

Awards Won: