Novel Exploration Of Cable Insulation Materials Using Electron Spin Resonance Spectroscopy

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Summary

The electron spin resonance (ESR) study, as one of the best spectroscopic tools for direct spectral studies and analysis in material science, will be carried out to characterize and simulate the thermal stress and heat-generated on insulation materials from practical loading of cable. The results will be used to evaluate the quality and main properties of raw and manufactured insulation materials. The presented work provides the first ESR investigation and evaluation of widely used power cable insulation materials, namely PVC, and XLPE. The analysis will include locally manufactured and imported raw plastic materials used by some Saudi power cable factories. Additives, like colorant and/or stabilizer, are used to standard shades lines of cables for ready identification and to enhance their quality. It is also intended in this study to identify the effect of these additives on maintaining the insulation properties of the studied samples. The results of PVC or XLPE polymeric insulation materials can be extended from life tests to the application of these materials for higher quality and improvement cable materials.