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Influence of electrochemical effects on vented tree initiation in accelarated tests

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The growth of water trees at contaminants/protrusions in the insulation of MV cables has been studied for many years [e.g. 1, 2] resulting in improvements of materials as well as of the cable construction.

This paper describes investigations and a test procedure to determine the sensitivity of an insulation/semicon combination to electrochemical degradation and vented tree initiation, respectively [3]. The approach evaluates the initiation of vented water trees in plaques and cable objects. The tree initiation has been related to changes in the semiconductive layer using electrical stress, elevated temperature and mechanical stress as the accelerants. The method has proved particularly effective for:

- examining the mechanism of degradation
- testing the resistance of certain material combinations to degradation under the influence of multiple factors.

The studies and experimental investigations with different insulation/semicon combinations have given a deeper insight to the underlying mechanism for the initiation of vented trees and the influencing parameters.

References

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