

Project 2

Determination of the dielectric characteristics of polymer nanocomposites

Objectives

The main objective of this project is the electrical and dielectric characterization of polymer nanocomposites such as their AC and DC breakdown strength, dielectric constants and the space charge quantity.

Background

Insulating materials constitute an essential part of any electrical equipment. Better insulation leads to the use of higher working stresses, reduction of equipment size and achievement of higher operational reliability.

Recent developments have shown that incorporating of dispersed clay nano-sized platelets into polymer matrices improve its mechanical and electrical properties. Before adoption of these nanocomposites by the electrical power industry, its properties must be well characterized and the influence of certain operating conditions understood. Certain properties would be more important in one application than in others. For example, in the

development of new insulation for high voltage DC cables the evolution of space charge and its dissipation with time would be much more critical than in the insulation for AC cables.

This project will concentrate initially on a relatively small number of selected measurement techniques to determine which dielectric properties are most sensitive to the presence and concentration of various types of nano-sized fillers and to the effects on electrical ageing.

Work Programme

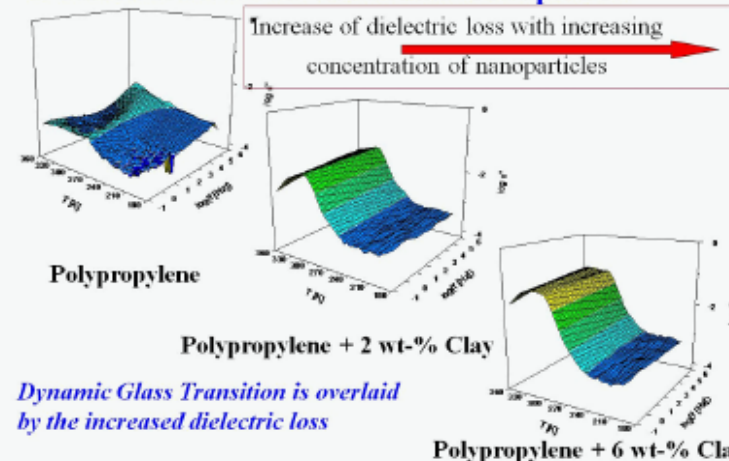
Measurement techniques to be used in the interlaboratory exercise:

- Thermal Step Method (TSM) and/or Pulsed Electro Acoustic (PEA) technique for space charge distribution measurements
- DC Polarization/Depolarization Current (including Conduction Current) measurements.
- AC ramp voltage breakdown tests.

Other techniques may also be considered based on the initial results.

Call for Participation

Dielectric Behavior of the Nanocomposites



Deliverables and Dissemination

- Test methods to determine the dielectric characteristics of PNCs,
- VAMAS Technical Report,
- Publications in scientific journals,
- Development of draft text for submission to international standards development organizations.

Funding

Participation is based on in-kind contributions from the partners.

Status

Interlaboratory trials currently in progress. Call for additional participants.

For more information on participation, please contact:

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