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DIELECTRIC SPECTROSCOPY OF TRANSFORMER OIL-BASED FERROFLUIDS WITH MN-ZN FERRITE NANOPARTICLES

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Transformers are one of the significant parts of the electrical power system. As the power transmission system is opting for high voltage high power transmission, high performance insulating materials are drawing attention of the electrical power industry. Nanofluids, formed by adding nanoscale particles to insulating oil, are stable and homogeneous suspensions that present advanced performance of electrical insulation and heat dissipation. Transformer oil-based ferrofluids with Mn-Zn ferrite nanoparticles have been characterized at different concentrations of particles. The dielectric-spectroscopy experiments were performed on the LCR meter in the frequency range up to 2 MHz for different AC and BC voltage. We demonstrate changes in the observed relaxation process by applying electric field with different intensity. Dielectric dissipation factor of ferrofluids samples was also compared. The low-frequency relaxation process features observed in experiments was assigned to the electric double layer polarization. How to reduce the negative effect of nanoparticles on dielectric loss of nanofluids, needs to be investigated further.

CANCELLED!

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Session Classification: Poster session