

# Dielectric Behaviour of Epoxy Resin – BaSrTiO<sub>3</sub> Nanocomposites

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Ceramic-polymer composites incorporating ferroelectric and piezoelectric nanoparticles, homogeneously dispersed within an amorphous matrix represent a novel class of materials. Ceramic nanoparticles embedded into a polymer provide composites exhibiting synergy between the flexibility, and high dielectric breakdown strength of polymers with the high permittivity values of the ceramics. These type of material systems can be used in numerous applications such as integrated decoupling capacitors, acoustic emission sensors, angular acceleration accelerometers, smart skins and leakage current controllers, as well as in military equipment and transport applications [1-5]. In the present study, nanocomposites of epoxy resin and ceramic BaSrTiO<sub>3</sub>, were prepared and studied varying the filler concentration. Dielectric properties and related relaxation phenomena were investigated by means of Broadband Dielectric Spectroscopy in the temperature range from 30 to 160 °C and in the frequency range from 10<sup>-1</sup> to 10<sup>-7</sup> Hz.

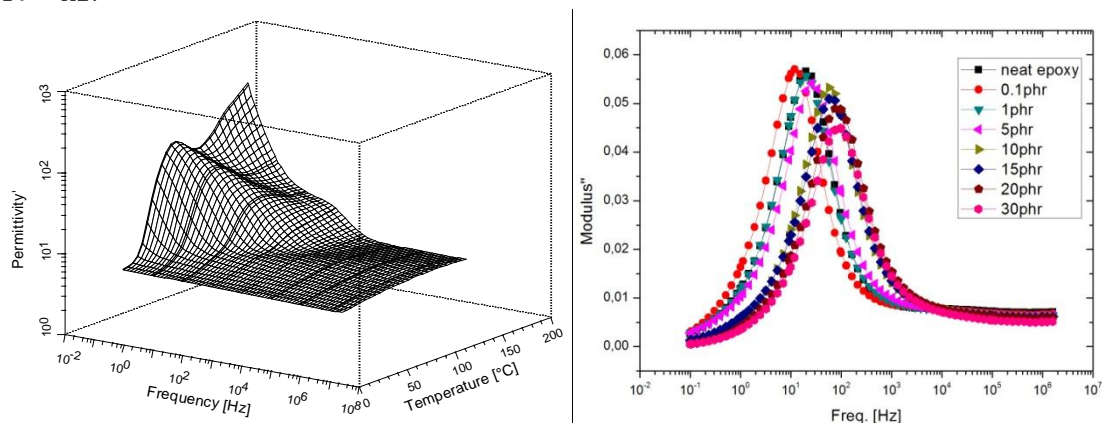


Figure 1. Real part of dielectric permittivity of the nanocomposite with 1 phr BaSrTiO<sub>3</sub> as a function of frequency and temperature (left). Imaginary part of electric modulus for all specimen, as a function of frequency at 80°C (right).

## References

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