



Sonderforschungsbereich 595 Elektrische Ermüdung in Funktionswerkstoffen



TECHNISCHE
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Raman spectroscopy of lead-free relaxor ceramics

Relaxor ceramics are being nowadays increasingly studied for industrial applications involving the conversion of electrical into mechanical energy and vice-versa. Following the environmental regulations that impose finding a suitable lead-free alternative to replace the dominant lead-based electroceramics, bismuth- or barium-based relaxors are currently under consideration for actuator applications.

In this talk, the use of Raman spectroscopy for the characterization of this class of materials will be presented. Due to its sensitivity to the short-range structure, this technique is especially effective if used together with dielectric, piezoelectric measurements or X-ray diffraction, methods that generally give a macroscopic picture of the structure and properties of the material. Raman spectroscopy can be used to detect phases, coexistence of phases, and their transition in dependence of electric field, pressure and temperature. Several examples of the application of this technique to the study of relaxors will be given, including sodium bismuth titanate (BNT), the most promising lead-free ferroelectric, and A-site and B-site substituted barium titanate (BT)-based ceramics. The relationship between the structures revealed by Raman spectroscopy and the dielectric and electro-mechanical properties of these compositions will be also discussed, thus highlighting the complementary role of Raman spectroscopy with other techniques.

Der Vortrag findet um **15:00 Uhr** im Gebäude der Materialwissenschaften,
Lichtwiese, Petersenstr. 23, **Raum 228** statt