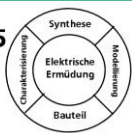


SFB 595



Deutsche
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Sonderforschungsbereich 595 Elektrische Ermüdung in Funktionswerkstoffen



TECHNISCHE
UNIVERSITÄT
DARMSTADT

Sonderkolloquium im SOMMERSEMESTER 2011

**18.05.
2011**

Prof. David Cann

Materials Science, Oregon State University

THE UNUSUAL BEHAVIOR OF $\text{Bi}(\text{Zn}_{1/2}\text{Ti}_{1/2})\text{O}_3$ IN PEROVSKITE SOLID SOLUTIONS

The presentation will summarize recent results on the crystal structure, dielectric properties, and piezoelectric properties of perovskite solid solutions with $\text{Bi}(\text{Zn}_{1/2}\text{Ti}_{1/2})\text{O}_3$ (BZT) as a component. With a tolerance factor of $t = 0.95$, BZT is not stable under normal atmospheres and pressures. However, recent work has shown that BZT can form solid solutions with a large number of stable perovskites such as PbTiO_3 , BaTiO_3 , NaNbO_3 , and $(\text{Bi},\text{Na})\text{TiO}_3$. The addition of the $\text{Bi}(\text{Zn}_{1/2}\text{Ti}_{1/2})\text{O}_3$ phase has a profound impact on the phase transition in a normal ferroelectric such as BaTiO_3 or an antiferroelectric such as NaNbO_3 . These systems exhibit a diffuse phase transition and a slim quasi-linear dielectric response with no measurable remanent polarization, which may be an indication of weakly-coupled relaxor behavior. This presentation will highlight recent findings on the influence of the microstructure and engineered point defects (i.e. non-stoichiometry and doping) on the dielectric response. In particular, we will show that cation deficient compositions exhibit an increase in relative permittivity, an increase in the insulation resistance, and a reduction in dielectric loss. It will also be shown that many BZT-based solid solutions also exhibit an unusual electromechanical strain behavior that is characterized by large hysteretic strains under E-fields above 50 kV/cm.

Die Vortrag finden um **15:00 Uhr** im Gebäude der Materialwissenschaften, Lichtwiese, Petersenstr. 23, **Raum 77**, statt.