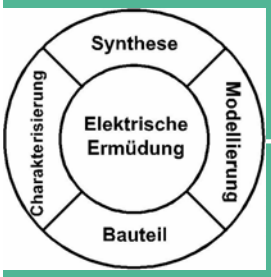

Sonderforschungsbereich 595

Elektrische Ermüdung in Funktionswerkstoffen

TECHNISCHE UNIVERSITÄT DARMSTADT

Sonderkolloquium im SOMMERSEMESTER 2008

09.05. 2008

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Defects, Charge Transport and Fatigue in Bi-Layer Ferroelectrics

There is increasing interest in using ferroelectric thin films as nonvolatile memory elements on computer chips. The direction of ferroelectric polarization can be switched by the application of a small voltage and will remain unchanged until deliberately switched again by the application of a voltage of opposite polarity. The original material of choice, Pb(ZrxTi1-x)O3, PZT, suffers from a decay in the amount of switched charge after many switching cycles. Eventually it becomes difficult or impossible to determine the state of polarization. Later, it was found that members of the Bi-layer ferroelectrics, the so-called Aurivillius phases, do not exhibit this ferroelectric fatigue. The major emphasis has been on SrBi2Ta2O9 and SrBi2Nb2O9. We undertook a study of the defect chemistry of these two isostructural compounds and found their behavior to be surprisingly different, even though Ta and Nb have extremely similar chemical behavior. The Ta compound appeared to be acceptor-doped, while the Nb compound appeared to be donor-doped, both at the level of a few percent, even though no dopants had been added. A suggested explanation for this bizarre behavior will be offered.

Der Vortrag findet um **14:00** im Gebäude der Materialwissenschaften, Lichtwiese, Petersenstr. 23, **Raum 128** statt