

第 17 回山梨エレクトロセラミックスセミナー

日 時 : 2013 年 3 月 25 日 (月) 14:00-15:30

場 所 : 情報メディア館 5 階多目的ホール

いつもお世話になっております。山梨大での研究活動の一環として、国内外の電子セラミックスの分野で活躍されている研究者の方々にその成果を発表していただく場として、新たに「山梨エレクトロセラミックスセミナー」を設立しました。その第 17 回として、以下の講演を行います。ぜひ、ご参加いただき、今後ともこの活動にご協力いただければ幸いです。

講師 : Jürgen Rödel 博士 (ユルゲン・ルーデル博士)

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講演題目 : 「Lead-free Piezoceramics 非鉛圧電材料」

講演概要

EU legislation, environmental concern, the Toyota Nature paper and scientific curiosity provided ample stimulus in the past 10 years to develop lead-free piezoceramics. There appears to be consensus, that there will not be just one composition to replace PZT, but that PZT can serve as a guideline for feasible mechanisms to develop a set of alternative non-toxic materials, but utilizing additional material concepts. I will outline general issues on toxicity, market relevance, research projects, publications and citations as well as general research focus over the last 10 years. Then I will outline material requirements for the different applications; these may not always be reflected in publications but are modified by general methodological availability. Then I describe different concepts to develop materials with different applications in mind. In the central part I will discuss current achievements in the quest for new lead-free materials and will contrast materials with morphotropic phase boundary (bismuth-based) with materials with polymorphic phase transitions (alkali-niobate based) to triple-point materials (barium titanate based). In an optional part the current status of “giant strain” or incipient piezoceramics will be considered. Here the focus will be on a comparison to Pb-based materials where the strain is concerned and where the microstructure and the relaxor behavior is concerned. A key element here is the existence of a depolarization temperature and the material behavior across this transition temperature. Especially, the concept of composites between relaxors and ferroelectrics will be highlighted.

* Rödel 教授は、現在、欧州における非鉛圧電材料研究の top の方です。

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