

第 22 回山梨エレクトロセラミックスセミナー

日 時： 2015 年 9 月 9 日（水） 15:00 – 16:00

場 所： 総合研究棟 2 階会議室

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 22 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。

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講演題目： ”**High Temperature Piezoelectric Ceramics and Single Crystals**”

「高温圧電セラミックス及び単結晶」

講演概要

This abstract will review recent developments in high temperature piezoelectric ceramics and crystals for use as actuators and sensors. The piezoelectric materials will be categorized in relation to their temperature usage range. Relaxor-PT ferroelectric crystals exhibit the highest piezoelectric d_{33} 's $>2000\text{pC/N}$, but are limited to low temperature applications such as medical ultrasound and sonar transducers. The ubiquitous PZT family can be operational up to temperature less than 300°C , being limited by T_C and thermal activated aging. For applications in environments greater than 300°C , one must leave the perovskite family, utilizing tungsten bronze and Aurivillius piezoelectrics. As such, the piezoelectric activity decreases by an order of magnitude, with values typically less than 20pC/N , limiting their usage to sensors. Thus, opportunities for perovskites piezoelectrics operational above 300°C remain. We will discuss recent work on high T_C perovskites with morphotropic phase boundaries, including bismuth based ceramics, such as BS-PT, BS-BMT-PT and BF-KBT-PT. Though perovskite T_C s can reach above 500°C , they are intrinsically limited by their electrical resistivity and strong temperature dependence. Applications above 500°C generally utilized non-ferroelectric piezocrystals. High temperature piezocrystals, including langatates, borates, melilite, and more recently fresnoite will be compared and discussed in relation to application parameters, such as crystal symmetry, resistivity, etc.

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