

# CHEMISTRY COLLOQUIUM

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3:15 PM, Room 111, Life Sciences

## *Piezoelectric Materials: Alloy Systems and Anisotropy*

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Piezoelectric materials are used in a wide range of applications, with the most common material being the solid solution alloy lead zirconate titanate (PZT). Promising alternatives to lead containing materials include alloys from the families of bismuth sodium titanates (BNT) and barium calcium titanate zirconates (BCTZ or BZT-BCT). To improve piezoelectric performance a crystallographic preferred orientation can be induced by processing using the tape casting method and a ferroelastic domain orientation can be introduced by electrically poling samples. Rietveld refinement of X-ray diffraction data can be used to quantify the induced preferred orientation. In BNT based materials an improvement in piezoelectric performance by up to 30% was achieved and is expected to also improve the already very impressive properties in BZT further.