

第5回フロンティア材料研究所講演会

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7月20日 15時～17時 すずかけホール集会室1にて

演題: Lead-free piezoceramics: From fundamentals to application

Two events galvanized a large research effort into lead-free piezoceramics about ten years ago:

- i. The European Union banned lead except for a set of temporary exemptions
- ii. The Toyota research group published a Nature paper in 2004, summarizing research over a 6-year period, proving that lead-free piezoceramics are a viable alternative to lead-containing piezoceramics.

In the following years the research output rose from 10 to 400 publications per year with China and Japan leading, Europe accounting for 10 % of the total quantity and the US only showing very select activities. By now, the first products have arrived at the market place. A number of Japanese companies have invested large sums into research and they aim at solid financial return. Some of them produced material reproducibly in 100 kg batches and select areas are known, where lead-free piezoceramics have an advantage to lead-containing piezoceramics.

I will structure the talk in three parts:

- i. Fundamentals of piezoelectric materials
- ii. Motivation, history, markets.
- iii. Fundamentals, describing recent work on single crystals to novel approaches using composites
- iv. Suggestions for applied research with an aim to fast transfer into application.

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