Contribution ID: **24** Type: **1. Plenary speaker (by invitation only)**

Advanced Sintering and the Future of Electroceramic Component Manufacturing: From HighSpeed Production to Energy Savings in a Low-Temperature Innovation

The processing of electroceramic materials remains foundational to the trillion-dollar electronics industry, integral to our contemporary computational, communication, and Artificial Intelligence infrastructure. This lecture provides a comprehensive review of the state-of-the-art in electroceramic processing, spanning established, high-speed manufacturing and a transformative emerging technology. Part I investigates the practical complexities and material science challenges underpinning the fast sintering of Multilayer Ceramic Capacitors (MLCCs). We detail how the co-firing of thin BaTiO3 dielectrics with Ni inner electrodes, executed under controlled low oxygen partial pressures, is critically impacted by interfacial defect thermochemical reactions driven by residual carbons. The presentation will detail the kinetic coupling between these defect reactions and densification, illustrating how a fundamental understanding of these phenomena has enabled the current industrial dominance of MLCC production.

Professional Status of the Speaker

Senior Scientist

Interest in submitting a paper in a special issue of

No interest

Invitation letter for visa

No

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Session Classification: Sintering for additive manufacturing

Track Classification: Group 4: Sintering for additive manufacturing