Contribution ID: **218** Type: **2. Invited speaker (by invitation only)**

Photonic sintering of ceramics

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For millennia, ceramics have been densified via sintering in a furnace, a time-consuming and energy-intensive process. The need to minimize environmental impact calls for new physical concepts. Here, we realize ultra-rapid heating with blue light. Bulk ceramics are sintered within seconds and with outstanding efficiency (≈2 kWhkg-1). Sintering on-the-spot with blacklight as versatile and widely applicable power source is demonstrated on various different ceramics (e.g. SrTiO3, BaTiO3, alumina, YSZ, LLTO and BaZrO3) needed for energy storage and conversion and in electronic and structural applications foreshadowing economic scalability.
Especially acceptor-doped BaZrO3, a proton conductor, has to be sintered at high temperature (> 1600 ℃) for long times (~ 24 h). At these sintering conditions, BaO is prone to evaporate, increasing the difficulty to produce stoichiometric ceramics. By blacklight sintering with a high-power blue laser, bulk BaZr0.8Y0.2O3 δ (BZY20) was sintered in <four minutes, mitigating BaO evaporation and achieving promising proton conductivity.

Professional Status of the Speaker

Senior Scientist

Interest in submitting a paper in a special issue of

Invitation letter for visa

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