Flash sintering of SrTiO3

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Flash-sintering of SrTiO₃

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**Introduction and motivation**

Sintering and grain growth experiments under an electrical field are conducted with SrTiO₃. Defect chemical calculations are implied to discriminate the most important parameters in the flash sintering process. A strong correlation of the onset of flash sintering with the defect chemistry was found. By controlling the current of the power source, the joule heating of the sample can be controlled. The results show many analogies to conventional sintering.

**Experimental setup**

- Material: SrTiO₃
- Influence of power control
- Impact of Fe doping
- Microstructural analysis
- Analogy to conventional sintering

**Onset of flash-sintering**

- Shifts to lower temperatures with increased doping.
- A correlation with the conductivity is found by defect chemical calculations.

**Flash-sintering (CHR)**

Similar to conventional sintering, doping results in decreasing density. Possible correlation with microstructure and pore coordination n.

**Control of sample temperature**

- Temperature control of the sample is possible (power-control).
- Combination with defect chemical calculations enhances understanding.

**Conclusion and perspective**

- Similarities to conventional sintering are found (densification and microstructure).

**Statement:** It’s Joule heating

**Experimental results**