

# Impact of microstructure on the thermoelectric properties of the ternary compound $\text{Ce}_3\text{Cu}_3\text{Sb}_4$

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We present detailed structural and thermoelectric studies of the ternary compound  $\text{Ce}_3\text{Cu}_3\text{Sb}_4$ . This material is of interest due to considerable thermopower above room temperature ( $\sim 100 \mu\text{V}/\text{K}$ ) and low thermal conductivity ( $2 \text{ W}/(\text{m K})$ ). We have used X-ray diffraction, scanning electron microscopy (SEM), and secondary ion mass spectrometry (TOF-SIMS) for microstructural characterization to study variation of thermoelectric data across the samples. The thermoelectric properties were examined using a PPMS measurement system. We analyze the impact of the sample quality on the thermoelectric properties. The properties variability is mainly due to structural defects caused by stresses during material preparation and also due to formation of foreign phases  $\text{CeCuSb}_2$  and  $\text{CeSb}$ . The figure of merit  $ZT$  is also strongly dependent on the quality of the sample. The largest value  $ZT \approx 0.15$  at 400 K is determined for the almost stoichiometric sample with small amounts of impurity phases.

## References:

[1] P. Witas et al., *Mater. Charact.* 123, 256–263 (2017)