

# Thermal stability of p-type skutterudites $\text{DD}_{0.6}\text{Fe}_3\text{CoSb}_{12}$ by Knudsen effusion mass spectrometry

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Thermoelectric materials have gained increased interest for their ability to exploit waste heat (renewable energy) and convert it to electricity in automotive and aerospace industry, electronics and other areas. The current research, among other materials, is oriented on doped  $\text{CoSb}_3$  based skutterudites with high ZT-levels which can further be increased, e.g. by nano-structuring. Current materials contain volatile elements (Sb, Sr, Yb, etc.), which can evaporate at operation conditions leading to structure changes, damaging the thermoelectric properties.

The temperature and phase stability of p-type skutterudites  $\text{DD}_{0.6}\text{Fe}_3\text{CoSb}_{12}$  exhibiting a high ZT-level have been studied by means of thermal analysis (TA) and Knudsen effusion mass spectrometry (KEMS). The results from phase transformation measurements and characteristics of evaporation of the volatile elements supported by microstructure observations and of diffusion profiles are summarized and discussed in view of a full understanding of the degradation processes and knowledge on long term operation stability of the bulk and nano-structured thermoelectrics studied.

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