

## Supplementary Information

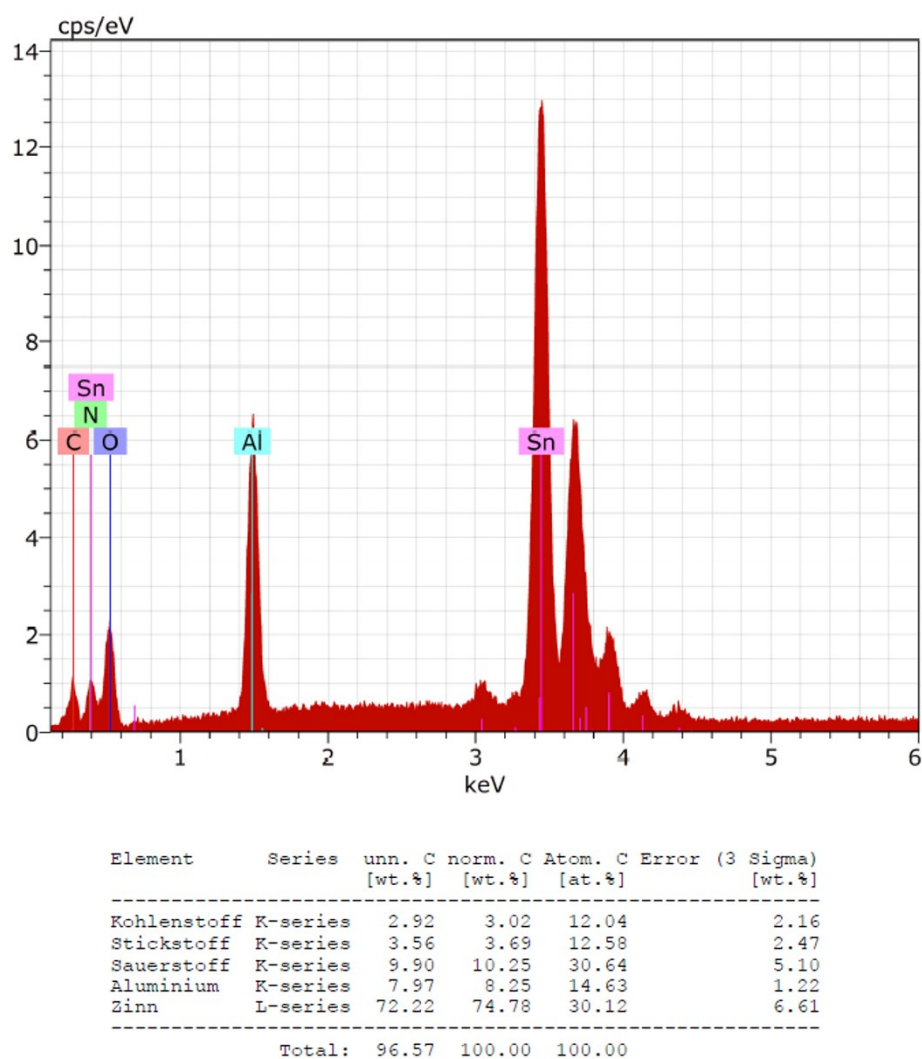
### Formation of tin-based crystals from SnAgCu alloy under formic acid vapor

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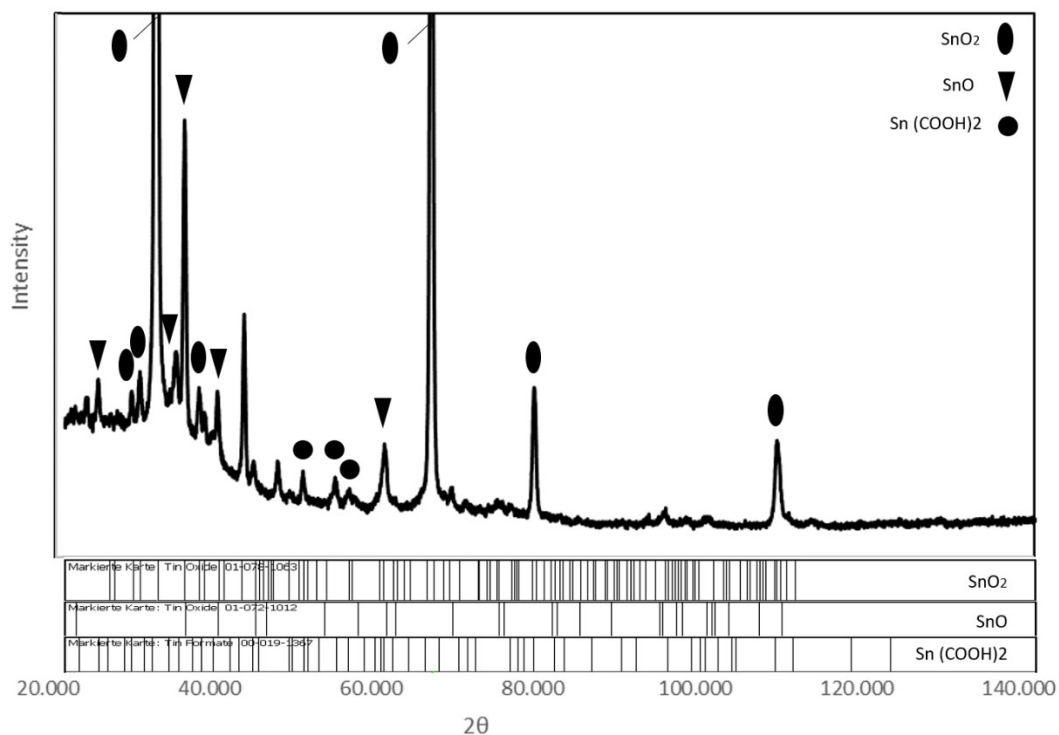
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**Figure S-1.** Energy dispersive X-ray (EDX) spectrum and corresponding elemental analysis of the crystals grown on AlN substrate. Measurements were performed with a Zeiss EVO MA 15 scanning electron microscope equipped with a Bruker XFlash 6/30 detector. The authors thank Mr. Maxim Hiersing at ContiTermic Microelectronic GmbH (Ingolstadt) for the kind collaboration.



**Figure S-2.** X-ray diffraction (XRD) spectrum of the crystals grown on a glass substrate. The attribution of the lines to the  $\text{SnO}_2$ ,  $\text{SnO}$  and  $\text{Sn}(\text{COOH})_2$  faces is marked with different symbols. Measurements were performed with a diffractometer (Empyrean) using  $\text{Co-K}\alpha_1$  radiation ( $\lambda = 1.788\text{\AA}$ ) at an accelerating voltage of 40 kV. The diffracted beam was scanned in steps of  $0.03^\circ$  across a  $2\theta$  range of  $20\text{--}140^\circ$ . The authors thank Prof. Ulrich Tetzlaff of THI and his team for the kind collaboration.