Tracing the structural evolution of sub-monolayer Sn phases on Au(111)

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Abstract

In this study, we investigate the effect of temperature and film thickness on the structure of sub-monolayer phases of Sn on Au(111). As the interface structure of low-dimensional materials is known to be a key determinant of their electronic properties, we primarily concentrate our analysis on the Sn/Au interface.
Here, we report a structural and chemical investigation of different sub-monolayer Sn phases on Au(111) using low-energy electron diffraction (LEED) and photoelectron spectroscopy (XPS). Gradually, tin layers of different thicknesses were deposited on the Au(111) surface by physical vapor deposition and subsequently heated. Our results reveal a strong correlation between the thickness of the films and the post-deposition annealing temperature with the structural and chemical configuration of the tin atoms. Our investigations tie in with our recently published results of the investigation of germanene on Ag(111).1)

References:
1) Kesper, L., Hochhaus, J.A., Westphal, C. et al. *Tracing the structural evolution of quasi-freestanding germanene on Ag(111).* Sci Rep **12**, 7559 (2022).

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