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【264】 In-situ TEM annealing experiments on epitaxial GeSn thin films.

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Epitaxial Ge_{0.9}Sn_{0.1} layers are well-suited for Si-integrated optoelectronics. However, their thermal stability at the nanoscale is far from a complete understanding. For detailed insights into the decomposition process induced by the components' negligible miscibility and the low Sn melting temperature, in situ TEM experiments have been performed. To trace the sample evolution upon annealing, cross-sectional and plan view lamellas were cut from mechanically wedge-polished specimens and installed on MEMS-based heating chips with an in-house FIB-assisted approach. Heating experiments were carried out from 300 K to above the Sn melting point. Combining complementary TEM techniques and spectroscopy has provided valuable information for efficient synthesis and application of desired materials.

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