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Growth and Atomistic Mechanisms of Snowflake-like ZnO Islands on curved substrates[1] GUO LI, Institute of Physics, Chinese Academy of Sciences; U of Tennessee-Knoxville, CHEN LI, CHENGMIN SHEN, CHAO HUI, JIFA TIAN, SHIXUAN DU, HONG-JUN GAO, Institute of Physics, Chinese Academy of Sciences, ZHENYU ZHANG, Oak Ridge National Laboratory, U of Tennessee-Knoxville — Various snowflake-like patterns are obtained during heretoepitaxial growth of ZnO on Zn-dominant spheres via chemical vapor deposition (CVD). Highly regular and symmetric dendritic patterns of varying compactness can be obtained at different cooling rates. Furthermore, a reduction in the relative concentration of oxygen supply leads to smooth compact islands with sharp or flat tops. The underlying atomistic formation mechanisms of these patterns are investigated using kinetic Monte Carlo simulations. We reproduce the dendritic patterns in the simulations and also propose a plausible mechanism for the growth of the compact patterns with different tops.

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