

Abstract Submitted
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Sidebranching in the Dendritic Crystal Growth of Ammonium Chloride ANDREW DOUGHERTY, Lafayette College — We report measurements of the dendritic crystal growth of NH_4Cl from supersaturated aqueous solution at small supersaturations. Sidebranch growth in this regime is challenging to model well, and the origin of the sidebranches is not fully understood. The early detection of sidebranches requires measurements of small deviations from the smooth steady state shape, but that shape is not well known at the intermediate distances relevant for sidebranch measurements. One model is that sidebranches result from the selective amplification of microscopic noise. We compare measurements of the sidebranch envelope with predictions of the noise-induced sidebranching model of González-Cinca, Ramírez-Piscina, Casademunt, and Hernández-Machado [Phys Rev. E, 63, 051602 (2001)]. We find that the measured amplitude is somewhat larger than predicted, and the shape of the sidebranch envelope is also different. A second model is that sidebranches result from small oscillations of the tip. We have observed no such oscillations, but very small ones can not be ruled out. No measurement of the tip region can be completely free of contamination from early sidebranches, so it can be challenging to distinguish between an oscillating tip and a smooth tip with sidebranches starting nearby.

Andrew Dougherty
Lafayette College

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