

Growth Performance and Critical Supersaturation of Heterogeneous Condensation for High Concentration of Insoluble Sub-Micron Particles

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Abstract : Measuring the growth performance and critical supersaturation of particle group have a high reference value for constructing a supersaturated water vapor environment that can improve the removal efficiency of the high-concentration particle group. The critical supersaturation and the variation of the growth performance with supersaturation for high-concentration particles were measured by a flow cloud chamber. Findings suggest that the influence of particle concentration on the growth performance will reduce with the increase of supersaturation. Reducing residence time and increasing particle concentration have similar effects on the growth performance of the high-concentration particle group. Increasing particle concentration and shortening residence time will increase the critical supersaturation of the particle group. The critical supersaturation required to activate a high-concentration particle group is lower than that of the single-particle when the minimum particle size in the particle group is the same as that of a single particle.

Keywords : sub-micron particles, heterogeneous condensation, critical supersaturation, nucleation

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