Numerical Studies on Convective-Diffusion During the Physical Vapor Transport Processes of Mercurous Chloride (Hg_2Cl_2)

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The temperature hump is found to be most efficient in suppressing parasitic nucleation. With the temperature humps, there are found to be observed in undersaturations along the transport path for convective-diffusive processes ranging from D_{AB} = 0.0584 cm^2/s to 0.584 cm^2/s, axial positions from 0 to 7.5 cm. With decreasing Ar = 5 to 3.5, the temperature difference is increased because of the imposed nonlinear temperature profile but the rate is decreased. For $2 \leq Ar \leq 3.5$, the rate is increased with the aspect ratio as well as the temperature difference. Such an occurrence of a critical aspect ratio is likely to be due to the effect of sidewall and much small temperature difference. The rate is decreased exponentially with the aspect ratio for $2 \leq Ar \leq 10$. Also, the rate is exponentially decreased with partial pressure of component B, P_B for $1 \leq P_B \leq$ 100 Torr.