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# Study on Mass Transfer of Droplets in Narrow Space

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## Abstract

Combinatorial or high-throughput experimentation are improving numerous scientific domains intensely, such as biological chemistry, material science, catalysis. In the past research, most of researchers focus on the novel configuration and microfabrication rather than the transfer mechanism in the microcosm. In this study, we proposed a mass transfer model among droplets in a narrow space. In the derivation, the molecular mass flow rate ( $J_M$ ) formula was used to calculate droplet mass transfer rate, which was controlled by the concentration gradient of the surface vapor pressure ( $P_S$ ) near the droplets. Especially, in the simplification of the expression of the simulating results, all droplets were divided into groups following their radii subtly. In order to assess the accuracy and predictive capability of the proposed model, we carried out some designed experiments to investigate distribution and size changes of the droplets at different temperatures and times. After capturing and analyzing the images of the droplets gathering on a hydrophobic glass slide in an airtight narrow space, we verified the

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