

Behavior of Droplets in Microfluidic System with T-Junction

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Abstract : Micro droplet formation is considered as a growing emerging area of research due to its wide-range application in chemistry as well as biology. The mechanism of micro droplet formation using two immiscible liquids running through a T-junction has been widely studied. We believe that the flow of these two immiscible phases can be of greater important factor that could have an impact on out-flow hydrodynamic behavior, the droplets generated and the size of the droplets. In this study, the type of the capillary tubes used also represents another important factor that can have an impact on the generation of micro droplets. The tygon capillary tubing with hydrophilic inner surface doesn't allow regular out-flows due to the fact that the continuous phase doesn't adhere to the wall of the capillary inner surface. Teflon capillary tubing, presents better wettability than tygon tubing, and allows to obtain steady and regular regimes of out-flow, and the micro droplets are homogeneous size. The size of the droplets is directly dependent on the flows of the continuous and dispersed phases. Thus, as increasing the flow of the continuous phase, to flow of the dispersed phase stationary, the size of the drops decreases. Inversely, while increasing the flow of the dispersed phase, to flow of the continuous phase stationary, the size of the droplet increases.

Keywords : microfluidic system, micro droplets generation, t-junction, fluids engineering

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