

Abstract Submitted
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Generation of fine droplets in a simple microchannel¹ SUDONG KIM, YOUNG WON KIM, JUNG YUL YOO, Seoul National University — In the present study, we designed a microfluidic platform that generates monodisperse droplets with diameters ranging from hundreds of nanometers to several micrometers. To generate fine droplets, T-junction and flow-focusing geometry are integrated into the microfluidic channel. Relatively large aqueous droplets are generated at the upstream T-junction and transported toward the flow-focusing geometry, where each droplet is broken up into the targeted size by the action of viscous stresses. Because the droplet prior to rupture blocks the straight channel that leads to the flow-focusing geometry, it moves very slowly by the pressure difference applied between the advancing and receding regions of the moving droplet. This configuration enables very low flow rate of inner fluid and higher flow rate ratio between inner and outer fluids at the flow-focusing region. It is shown that the present microfluidic device can generate droplets with diameters about 1 micrometer size and standard deviation less than 3%. The present study is extended to synthesis of solid particles by using photopolymer mixed with fluorescence dye rhodamine and ultra violet light.

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