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Influence of Capillary Number on Pressure Profile Evolution in Microfluidic T-Junction

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Abstract **-** A three dimensional, numerical model has been developed to predict variation of pressure during droplet formation in microfluidic T-junction. Investigations have been carried out to examine the influence of capillary number on pressure variation during the entire cycle of droplet generation. With increase in Capillary number, width of dispersed phase in main channel decreases and the hydrodynamic resistance to flow of continuous phase fluid decreases, resulting in a smaller pressure drop along the microchannel. Pressure difference across the thread of dispersed phase is calculated during the droplet formation for different values of Capillary number. The pressure difference across the thread of dispersed phase decreases with increase in Capillary number. The frequency of upstream pressure fluctuations coincides with the formation of the droplet, and the amplitude and pitch of the pressure fluctuations varies with the Capillary number.

Keywords**:** *Microfluidic Droplet generation; T-junction; two phase Level SET method (LSM).*