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Experimental Studies of Liquid/Liquid Droplets Transport in Curved Microchannels ZEYAD ALMUTAIRI, University of Waterloo/King Saud University, TOMASZ GLAWDEL, CAROLYN REN, DAVID JOHNSON, University of Waterloo — This study utilizes optical visualization techniques to experimentally investigate the changes in transport properties of liquid droplets while they travel through microchannel turns. This study was prompted by observations that showed the length and speed of the droplet dynamically change while it is travelling through the turn. To gain insightful understanding of this phenomenon, systematic studies were carried out experimentally where the channel width, height, and turn radius were varied together with flow conditions in the low Capillary and Reynolds number flow regimes. Experimental findings reveal that the dynamic changes in droplet transport through curved microchannels are mainly caused by geometrical properties of the turn such as radius to channel width ratio and the height ratio. We also believe that the behavior of droplets in turns may dynamically affect the pressure gradient in the microchannel.

Zeyad Almutairi
University of Waterloo

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