Abstract Submitted
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A linear behavior between squeezing pressure and advancing length: when squeezing a viscous droplet into circular narrow confinement at capillary number = 3/4 CHRISTOPHER LANDRY[1], XIAOLIN CHEN[2], Washington State University Vancouver, ZHIFENG ZHANG[3], Delaware Innovation Campus, American Air Liquide — Particle squeezing through narrow constricted channels occurs in many processes throughout biomedical and chemical engineering fields. Applications range from lab-on-chip devices and pipette aspiration to transport through single pore as well as porous media. Recently, particle behaviors are compared based on particle properties and operation parameters. In the present research, an approximately linear relation between squeezing pressure and advancing length, in which the squeezing of a viscous droplet behaves like a linear solid particle, is found at Ca=3/4. Within the range of theoretical assumption, numerical modeling is conducted to validate the linear relation between the squeezing pressure and advancing length. This finding may have potential implications in cell/particle filtration, aspiration device design, enhanced oil recovery, etc.

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