

Komitet Mechaniki Polskiej Akademii Nauk

Politechnika Rzeszowska
im. Ignacego Łukasiewicza

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MICROFLUIDIC TRAP SIZE OPERATIONS ON DROPLETS

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Techniques operating on droplets and treating them as single reactors are very promising due to their advantages: i) lack of dispersion, ii) fast mixing, iii) superior control on kinetics of reactions, iv) easy to parallelization v) small volume¹. The challenge is to control the size and content of each droplet simultaneously.

We present concept of microfluidic modules that taking advantage of the capillary back-pressure, allow to trap, dose and realize precise portion of liquid. The precision is encrypted in the geometry of the device and a large mismatch of shear stresses and capillary forces. This mismatch guaranties reproducibility over a wide range of rates of flow that need not be controlled precisely. We also demonstrate that these modules allow to build systems that perform complicated protocols precisely while not precise control.

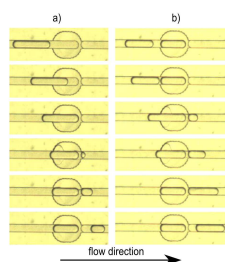


Fig. 1: Example of metering trap. a) – filling the trap by the flow of long droplet, b) – droplet passing the filled trap.

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