Abstract Submitted
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Solute-Driven Colloidal Particle Manipulation in Continuous Flows Past Microstructured channels.[1] GUIDO BOLOGNESI, GORAN T. VLADISAVLJEVIC, Dept. of Chemical Engineering, Loughborough University, UK, FRANCOIS NADAL, Dept. of Mechanical Engineering, Loughborough University, UK, CECILE COTTIN-BIZONNE, CHRISTOPHE PIRAT, Universite Claude Bernard Lyon 1 - CNRS, France, NAVAL SINGH, Dept. of Chemical Engineering, Loughborough University, UK — Recent advancements in the chemical and biological analysis have led to the integration of colloidal particle manipulation capabilities into microfluidic devices. Various active techniques have been employed for particle operations. The ability to manipulate particles by diffusiophoresis – a phoretic phenomenon leading to particle motion along a solute concentration gradient without the use of an external field – has gained an increasing attention. The aim of this study is to explore diffusiophoresis to enable particle filtration, trapping, and accumulation within a microfluidic environment under continuous flow settings. A microchannel, made of an optical adhesive and fitted with a micro-structured wall, was fabricated by photo-/soft-lithography. The charged fluorescent colloidal particles were accumulated within the channel microstructures by pumping electrolyte solutions into the device junction to generate salt concentration gradients. The spatial distribution of particles was characterized via confocal microscopy. This novel approach of particle handling in lab-on-a-chip device by solute driven transport can unlock potential applications in point of care industry, drug delivery and biosensing.

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