Application and simulation of hydrodynamic laminar flow focusing in a micro channel

송영수, 박 글, 최영훈, 양광석, 김도현*
KAIST 생명화학공학과
(DoHyun.Kim@kaist.ac.kr*)

We have applied hydrodynamic laminar flow focusing in a micro channel to the micro line patterning of functionalized carbon nanotubes and simulated by the finite element method with the level-set scheme. When the carbon nanotubes were immobilized on a glass substrate, the laminar flow focusing method reduced the width of stream which contained the carbon nanotubes. In this way, carbon nanotube lines of several microns or sub-micron scale can be easily obtained by a conventional soft lithography technique and a low-cost micro device fabricated by plastic molding technique. In hydrodynamic flow focusing, the width and location of the focused stream depend on the flow rate ratio of the streams. To predict the width and location of the focused stream, the flow field in a micro channel was simulated by the finite element method under the assumption of the immiscible fluid and compared with experimental results.