Abstract

In this paper we investigate a microfluidic device designed for separation of particles having different densities. Separating mechanism employs Standing Surface Acoustic Waves (SSAWs). Simulation studies have shown that Polyethylene microspheres with diameter of 10µm, having a density of 1200 kg/m³, can easily be detected from the same sized Melamine microspheres having a density equal to 1710 kg/m³.

References

3. N. Ye, J. Qin, W. Shi, X. Liu and B. Lin, Cell-based high content screening using an
5. J. Seo, M. H. Lean and A. Kole, Membrane-free microfiltration by asymmetric inertial
6. N. Pamme, Continuous flow separations in microfluidic devices, Lab Chip, 2007, 7,
1644–1659.
7. C. Blattert, R. Jurischka, A. Schoth, P. Kerth and W. Menz, Fabrication and testing
blood cell sorting by a magnetic gradient without labelling, Anal Bioanal.Chem., 2008, 392,
1317–1324.
Separation of Particles Utilizing a Laminar Flow Profile in a Pinched Microchannel, Anal. Chem.,
McDonnell, M. B., and Coakley, W. T., Spore and micro-particle capture on an immunosensor
surface in an ultrasound standing wave system, Biosensors and Bioelectronics, 21(5), 758-767
(2005).
of lipid particles from erythrocytes by means of laminar flow and acoustic standing wave
with Adjustable Effective Pore Size for Automated Sample Preparation, Analytical Chemistry,
80(22), 8447-8452 (2008).
14. Koklu, M., Sabuncu, A. C., and Beskok, A., Acoustophoresis in shallow microchannels,
B. S., Graves, S. W., and López, G. P., Elastomeric Negative Acoustic Contrast Particles for
17. Ramli, N.A. , Nordin, A.N. , Design and modeling of MEMS SAW resonator on Lithium
Niobate , 2011 4th International Conference on Mechatronics (ICOM), 17-19 May 2011, Kuala
Lumpur, Malaysia.
separation in a microfluidic channel via standing surface acoustic waves (SSAW), Lab on a
Chip, 9(23), 3354-3359 (2009).
20. Nam, J., Lim, H., Kim, D., and Shin, S., Separation of platelets from whole blood using
21. Yosioka, K., and Kawasima, Y., Acoustic radiation pressure on a compressible sphere,
Numerical Analysis of 3D Model of the SSAW Separator System


Index Terms

Computer Science

Image Processing

Keywords

SSAW, IDT, density-based.