Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Paper-based flow fractionation system for preconcentration and field-flow fractionation.[1] SEOKBIN HONG, Sogang University, RHOKYUN KWAK, Korea Institute of Science and Technology, WONJUNG KIM, Sogang University — We present a novel paper-based flow fractionation system for preconcentration and field-flow fractionation. The paper fluidic system consisting of a straight channel connected with expansion regions can generate a fluid flow with a constant flow rate for 10 min without any external pumping devices. The flow bifurcates with a fraction ratio of up to 30 depending on the control parameters of the channel geometry. Utilizing this simple paper-based bifurcation system, we developed a continuous-flow preconcentrator and a field-flow fractionator on a paper platform. Our experimental results show that the continuous-flow preconcentrator can produce a 33-fold enrichment of the ion concentration and that the flow fractionation system successfully separates the charged dyes. Our study suggests simple, cheap ways to construct preconcentration and field-flow fractionation systems for paper-based microfluidic diagnostic devices.

[1]This work was supported by the National Research Foundation of Korea(NRF) grant funded by the Korea government(MSIP) (NRF-2015R1A2A2A04006181).

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Date submitted: 30 Jul 2015 Electronic form version 1.4