

Abstract Submitted  
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**Melt Crystallization in Microfluidics for Sample Concentration**

POORIA SHARIF-KASHANI, H. PIROUZ KAVEHPOUR, University of California, Los Angeles — Melt crystallization in microfluidics is a novel approach to concentrate/purify a diverse range of samples from particles to ions. In this technique, the difference in solubility of solutes in the liquid and solid phase of the solvent drives the transport of the solutes. Consequently, this method has the advantage of being non-invasive and entirely thermally-actuated with no moving parts. A fluid sample is frozen in a microchannel and melting zones are passed repeatedly through the stationary sample to increase the concentration of solute at one end. The device is constructed using a thermoelectric cooler to freeze the sample and thin-film resistive heaters to create melting zones. The heaters are operated independently, allowing them to be switched on or off to create a localized melting zone in the channel. The performance of the system is successfully tested for a variety of samples including aqueous solutions and water containing micro-particles.

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