Electronic Supplementary Material (ESI) for Analyst.

Supporting Information

A Thread-based Electrofluidic Platform for Direct Transfer, Separation, and Pre-Concentration of Material from Sample Swabs.

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Transfer of different sized and charged molecules - The transfer and focusing of different sized and charge analytes, such as negatively charged fluorescein (323 Da), mixture of positively charged palmatine (352 Da), coptisine (320 Da), and berberine (336 Da) alkaloids, and negatively charged fluorescently tagged myoglobin (17kDa) was also studied. In case of fluorescein and myoglobin, a 5mM TRIS/ 2.5mM HEPES solution was used as the terminating electrolyte (TE), and 20mM TRIS/10mM HCl solution was used as the leading electrolyte (LE). While in the case of alkaloids, a 20mM β-alanine solution was used as TE, and 20mM potassium acetate solution was used as the LE. The transfer for fluorescein and myoglobin was carried out by applying a constant current of +300 μA and in anodic mode, where the cathode was placed within the inlet buffer reservoir, and the anode was placed in the outlet reservoir. In case of alkaloids, the transfer was carried out by applying constant current of -200 μA and in cathodic mode.

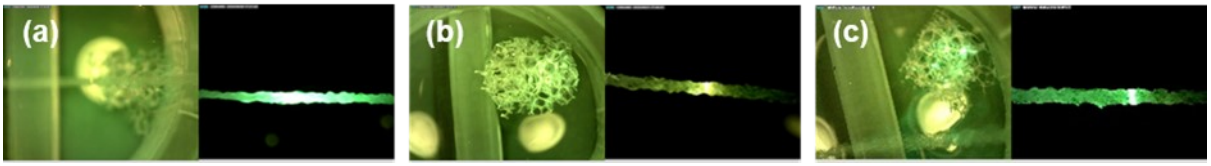

Figure S-1. Fluorescence images of the swab and the thread as found after the transfer and isotachophoresis of a) fluoresceine, (b) an alkaloid mixture, and (c) fluorescently tagged myoglobin.

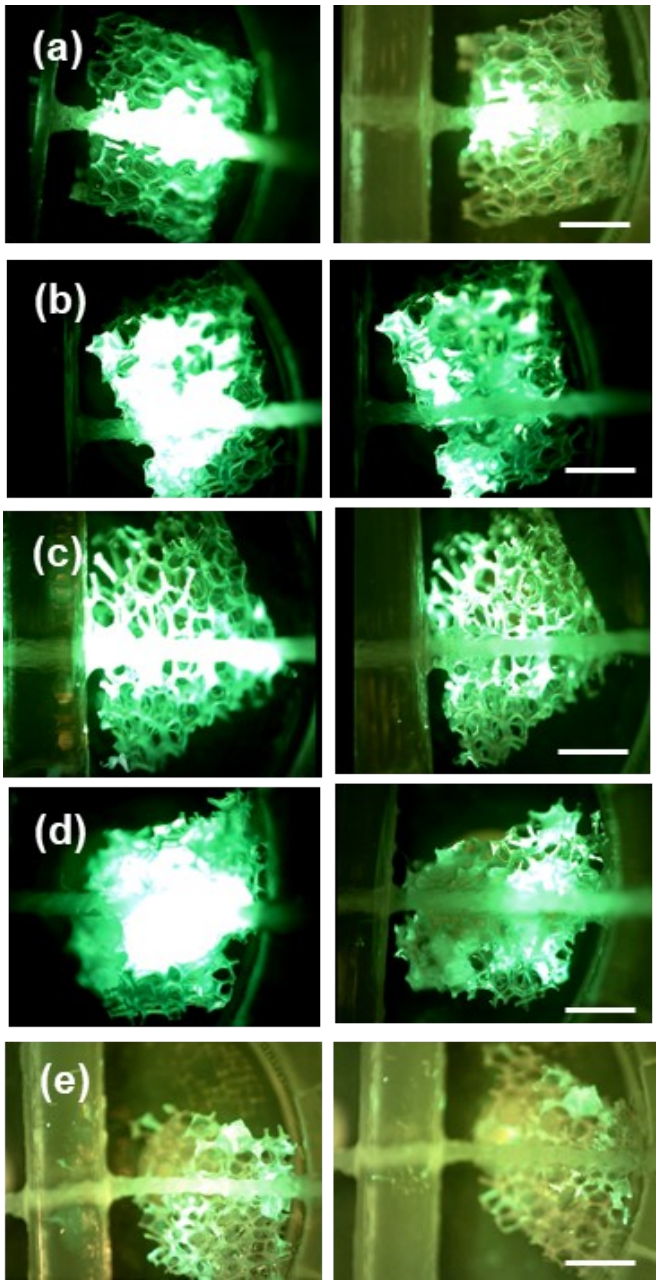

Figure S-2. The swab and thread junction before (left) and after (right) the transfer of a liquid sample dried on a (a) plastic surface and swabbed with a pre-wetted swab, (b) plastic surface and swabbed with a dry swab, (c) metallic surface and swabbed with a pre-wetted swab, (d) metallic surface and swabbed with a dry swab, (e) wooden surface and swabbed with a pre-wetted swab. The scale bar is 2 mm.