Electronic Supplementary Information for

Microfab-less Microfluidic Capillary Electrophoresis Devices

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Effect of capillary length. In order to demonstrate the possibility to change and customize the capillary length in the proposed design, the effect of four different capillary lengths on the separation was investigated: 15 cm, 30 cm, 45 cm and 60 cm (effective lengths of 11 cm, 26 cm, 41 cm, and 56 cm, respectively). As observed in Figure ESI-1, significant increases in the analysis times and separation efficiencies were obtained when the separation was performed using longer capillaries. Based on these results, 60 cm was selected as the optimum length and was used for all the experiments described in this manuscript.

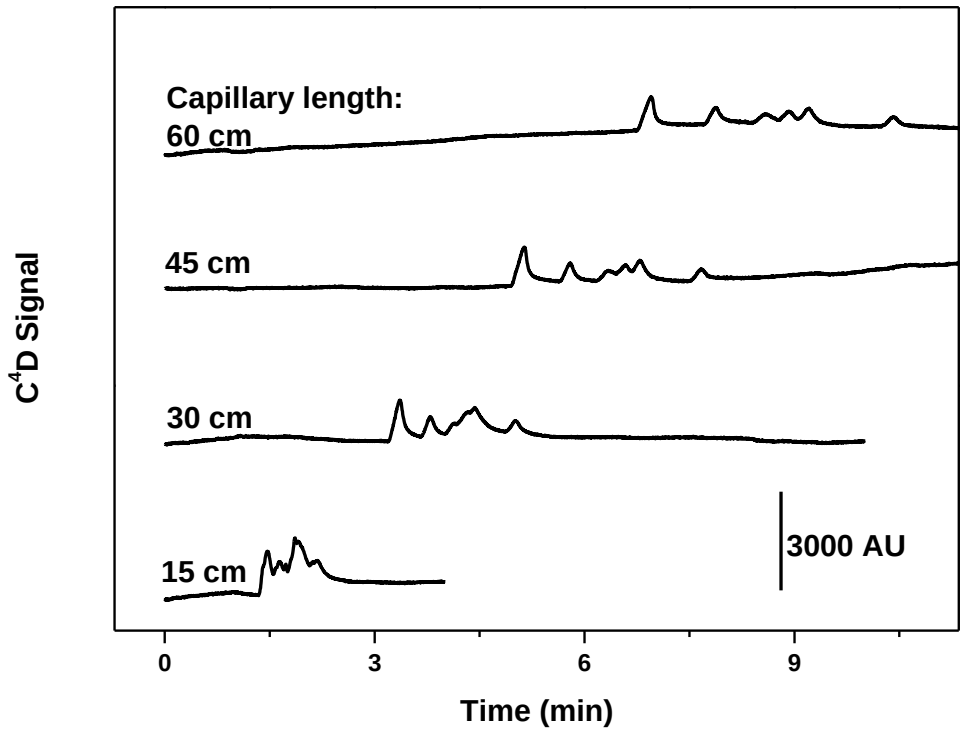

Figure ESI-1: Electropherograms comparing four different capillary lengths. Conditions: 170 $V.cm^{-1}$ as electric field; 30 mmol L^{-1} MES and 30 mM HIS mmol L^{-1} + 3 mmol L^{-1} 18-crown-6 as running buffer; hydrodynamic injection of 100 µmol L^{-1} cations mixture. Migration order as described in relevant manuscript figures.

Analysis of soil samples. The identification and quantification of the components of each sample was performed by comparing the electropherograms obtained with standard solutions to those obtained with the corresponding samples under the optimal conditions. As shown in Figure ESI-2, a main peak at 8.9 min was observed in all samples, with a migration time matching that of

Ca^{2+}. In two samples (AT40B1-44 and AT40B1-54), it was also possible to identify a second peak with much lower intensity that was assigned to Na^{+}.

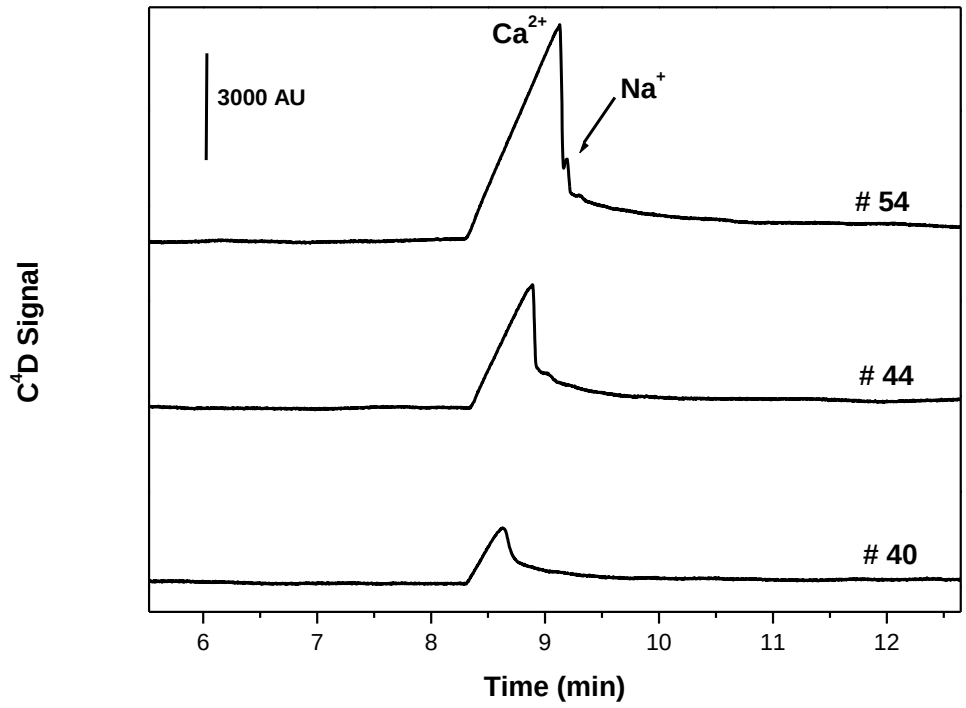

Figure ESI-2: Electropherograms of the Atacama's soil samples.

Analysis of soil samples by EDX. In order to verify the results obtained, the elemental composition of the soil samples was analyzed by energy dispersive X-ray spectroscopy (EDX). Figure ESI-3 shows representative SEM images of the samples, highlighting the area used for the analysis.

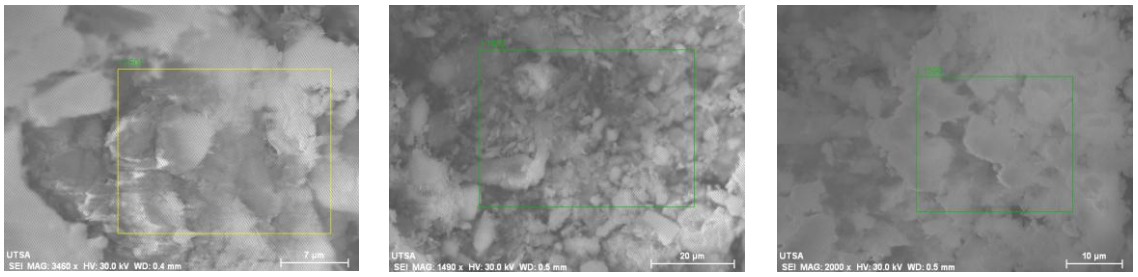

Figure ESI-3: Representative SEM images (30.0kV) of the soil samples obtained for the elemental analysis by EDX.

Relevant to the results described in the manuscript, Figure ESI-4 (A-C) show a prominent peak

for calcium in all samples, following by an small Na^+ peak in samples AT44B1-08 (Figure ESI-4B) and AT54A1-08 (Figure ESI-4C).

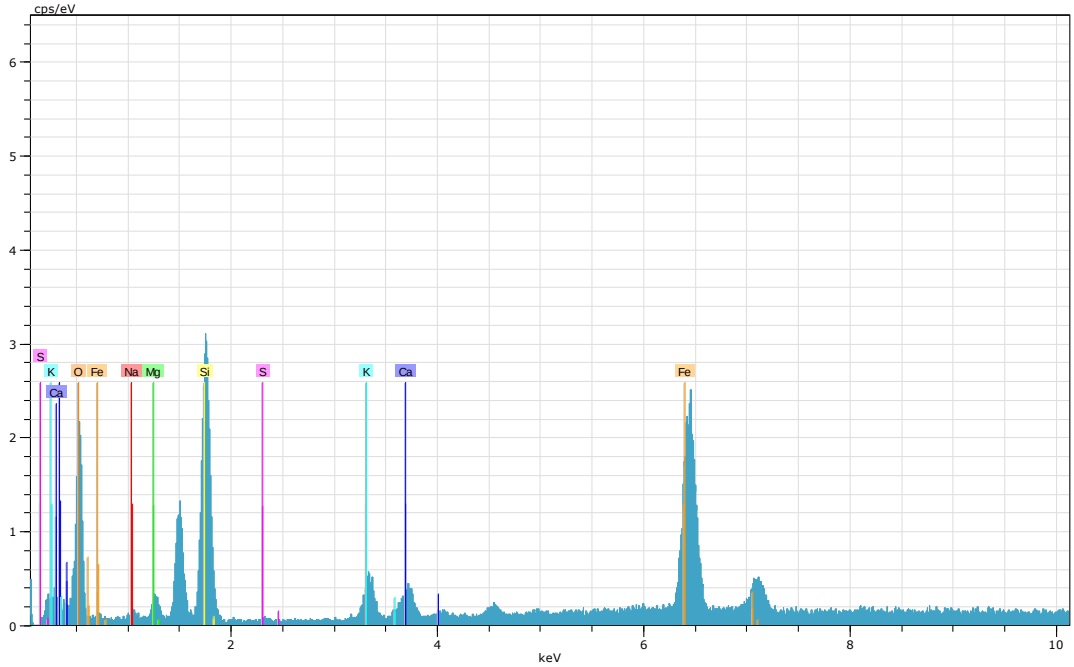

Figure ESI-4A: EDX spectrum obtained from Sample AT40B1-08

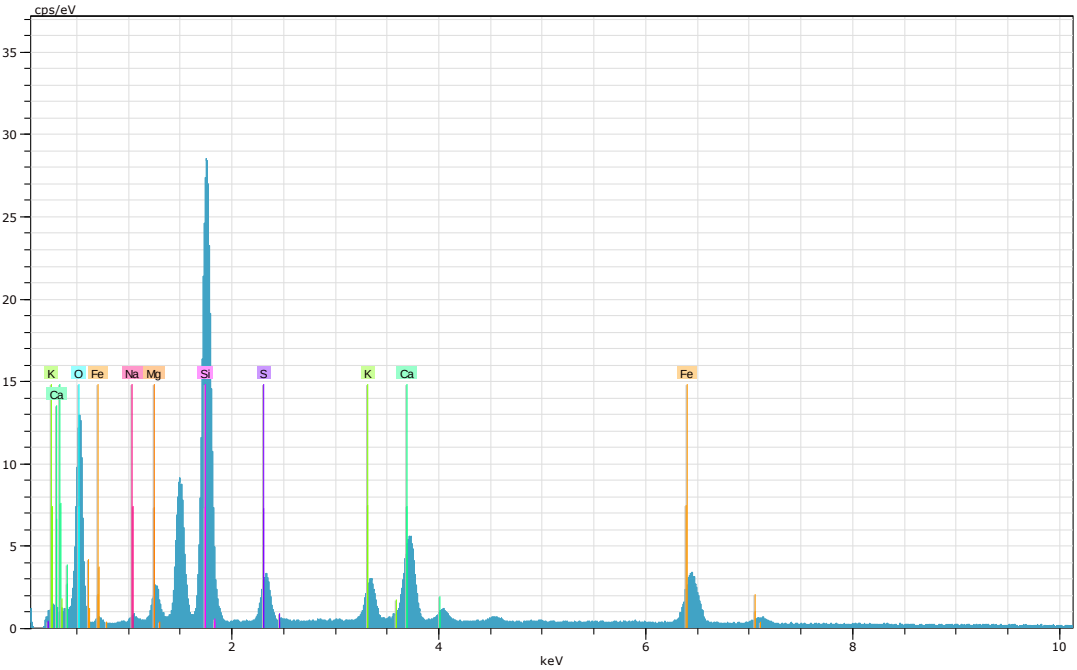

Figure ESI-4B: EDX spectrum obtained from Sample AT44B1-08

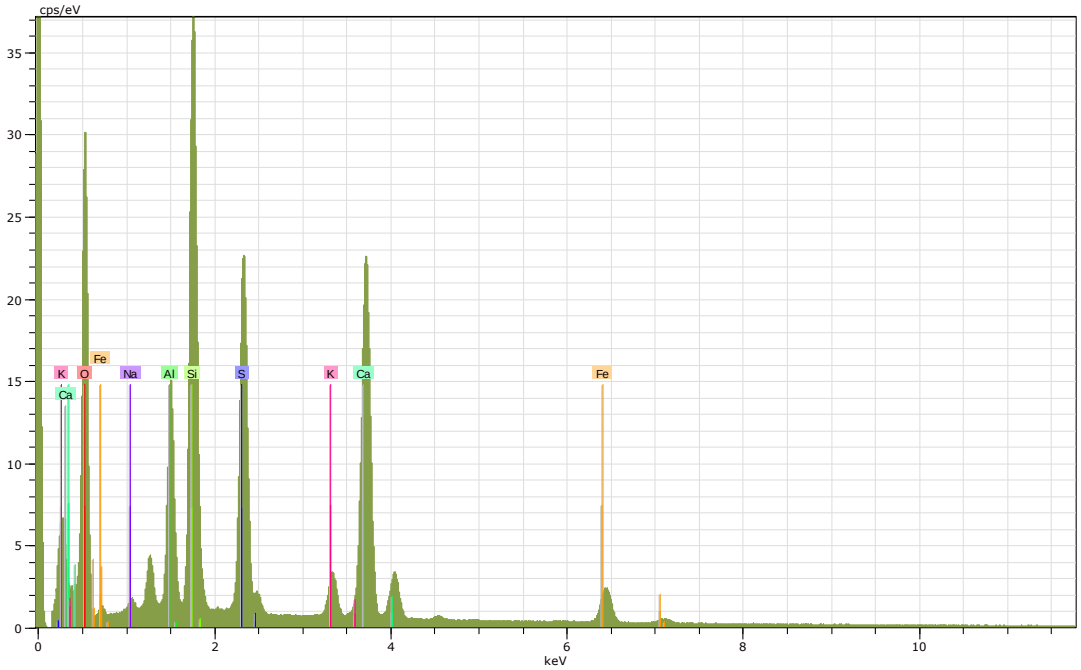

Figure ESI-4C: EDX spectrum obtained from Sample AT54A1-08