[0131] **FIG. 1B** shows a perspective view of the injection side of a polymer monolith/multi-nozzle electrospray device **250** of the present invention. **FIG. 1B** shows a perspective view of the injection or polymer monolith side of a four-nozzle electrospray device array **250** of the present invention. This figure shows a fluid delivery device **258** incorporating a seal **260** for sealing against the injection side surface circumscribing the reservoir containing a polymer monolith **254**.

[0132] **FIG. 1C** shows an array **250** of reservoirs **232** in alignment with a polymer separation block **276**. The polymer separation block **276** has an array of channels **254** containing the polymer separation monolith which is aligned with the array **250** of reservoirs **232**.

[0133] FIGS. 1D-1E show plan views of 1, 2, 3 and 14 nozzle electrospray devices, respectively, of the present invention. FIGS. 1H-1K show perspective views of the nozzle side of an electrospray device showing 1, 2, 3 and 14 nozzles **242**, respectively, etched in the recessed annular region **240** of the silicon substrate **200**. FIGS. 1L-1O show cross-sectional views of 1, 2, 3 and 14 nozzle electrospray devices, respectively. The nozzle **242** or ejection side of the device and the reservoir **232** or injection side of the device are connected by the through-substrate channels **234** thus creating a fluidic path through the silicon substrate **200**.

[0134] Fluids may be introduced to this microfabricated electrospray device by a fluid delivery device such as a probe, conduit, capillary, micropipette, microchip, or the like. The perspective view of **FIG. 1B** shows a probe **258** that moves into contact with the injection or reservoir side of the electrospray device of the present invention. The probe can have a disposable tip. This fluid probe has a seal **260**, for example an o-ring, at the tip to form a seal between the probe tip and the injection surface of the substrate **200**. **FIG. 1B** shows an array of a plurality of electrospray devices fabricated on a monolithic substrate. One liquid sample handling device is shown for clarity, however, multiple liquid sampling devices can be utilized to provide one or more fluid samples to one or more electrospray devices in accordance with the present invention. The fluid probe and the substrate can be manipulated in 3-dimensions for staging of, for example, different devices in front of a mass spectrometer or other sample detection apparatus.

[0135] FIGS. 2A-2C illustrate the deposition of a discreet sample onto a polymer monolith/multiple-electrospray device **250** of the present invention. The figures show a fluidic probe **262** depositing or transferring a sample to a polymer monolith **254** on the injection surface. The fluidic sample **264** is delivered to the polymer monolith **254** as a discreet volume, generally less than 100 nL. Alternately, this reservoir surface may be coated with a different retentive phase, such as a hydrophobic C18-like phase commonly used for LC applications, for increasing the partition of analytes contained within the fluid delivered to the reservoir surface. The analytes **266** A & B partition into the polymer monolith **254** while the fluid droplets **264** evaporate. As shown in FIGS. 2D-2E, a fluid delivery probe **258** is sealed against the injection surface by a seal **260** to deliver a fluid mobile phase to the microchip to reconstitute the transferred analytes **266** for separation and electrospray mass spectrometry analysis.

[0136] **FIG. 2A** shows a probe **262** that apportions a fluid **264** containing analytes **266** A & B onto the polymer monolith **254** contained within a reservoir on the injection side of a polymer monolith/multiple electrospray device **250** of the present invention. **FIG. 2B** shows the fluid delivery device **262** retracted from the device **250** leaving a fluid droplet **264** on the polymer monolith **254**. The analyte molecules **266** will partition onto the polymer monolith while the fluid droplet **264** evaporates to dryness as shown in **FIG. 2C**. **FIG. 2D** shows a fluid delivery device **258** incorporating a seal **260** to the injection side of the device **250** used to deliver a solution **268** suitable to elute the analytes **266** through the polymer monolith **254** for electrospray mass spectrometry analysis of the eluted analytes. The fluid probe **258** and the polymer monolith/multiple electrospray device **250** can be manipulated in 3-dimensions for staging of different devices in front of a mass spectrometer. The probe can have a disposable tip, such as a capillary, micropipette, or microchip.

[0137] FIGS. 3A-3D illustrate the loading of a larger sample volume, such as a direct interface stream, by directly sealing a fluid delivery probe to the injection surface of the polymer monolith/multiple-electrospray device of the present invention. **FIG. 3A** shows the loading of the sample on the polymer monolith. **FIG. 3B** shows an eluting solution delivered to the loaded monolith to separate and elute the analytes as shown in FIGS. 3C-3D.

[0138] FIGS. 4A-E illustrates a reservoir **276** bonded to the injection side of the device for acceptance of higher fluid volumes. **FIG. 4A** shows the loading of a larger sample volume **264** by directly sealing a fluid delivery probe **262** to the reservoir **276** on the injection surface of the polymer monolith/multiple-electrospray device of the present invention. The analyte molecules A & B will partition onto the polymer monolith **254** as shown in FIGS. 4B-4C. **FIG. 4D** shows a fluid delivery device **258** incorporating a seal **260** to the injection side of the device **250** used to deliver a solution **268** suitable to elute the analytes A & B through the polymer monolith **254** for electrospray mass spectrometry analysis of the eluted analytes. FIGS. 4D-4E show an eluting solution delivered to the loaded monolith to separate and elute the analytes from the monolith.

[0139] FIGS. 5A-D show the reservoir **276** also containing polymer monolith to increase the length of the separation bed for these through-substrate separations. **FIG. 5A** shows the loading of a larger sample volume **264** by directly sealing a fluid delivery probe **262** to the reservoir **276** on the injection surface of the polymer monolith/multiple-electrospray device of the present invention. The analyte molecules A & B will partition onto the polymer monolith **254** as shown in **FIG. 5B**. **FIG. 5D** shows a fluid delivery device **258** incorporating a seal **260** to the injection side of the device **250** used to deliver a solution **268** suitable to elute the analytes A & B through the polymer monolith **254** for electrospray mass spectrometry analysis of the eluted analytes. FIGS. 5C-5D show an eluting solution delivered to the loaded monolith to separate and elute the analytes from the monolith.

[0140] **FIG. 6** shows a cross-sectional view of a two-nozzle array of the present invention. As shown in **FIG. 6**, to generate an electrospray, fluid **268** may be delivered to the through-substrate channel **234** of the device **250** by a conduit **258**, for example, such as a capillary, micropipette, or microchip. The fluid **268** is subjected to a potential