upon a number of factors, such as the desired volume of the reservoir defined at first end **32** and also the thickness of the substrate body **20**. According to one exemplary embodiment, the microfluidic channel **30** has a length of about 3 mm or greater. However, the aforementioned dimensions are merely recited to illustrate one exemplary embodiment and it will be understood that the microfluidic device **10** can be fabricated to have other dimensions.

[**0039**] The volume of the reservoir **60** should be such that it can hold an amount of sample material that is typically used in the applications that the microfluidic devices are designed for. For example, the sample volume that is used is from sub-microliter up to 10 microliters for mass spectrometer analysis using electrospray. As will be described in greater detail hereinafter, the sample material is held in the reservoir **60** and is then transported within the microfluidic channel **30** to the nozzle **50** where the sample materials are finally discharged through the open second end **34**. The outside diameter of the protruding nozzle **50** also accordingly increases in a direction away from the tip portion **52** thereof. By forming the reservoir **60** or input port at the first surface **22** opposite to the second surface **24**, where the nozzle **50** is formed, a sample can easily be fed into the microfluidic channel **30** by injecting or otherwise disposing the sample into one or more reservoirs **50** and then transporting the sample through the associated microfluidic channel **30** using techniques described in greater detail hereinafter.

[**0040**] Turning now to **FIG. 3**, the microfluidic device **10** can be fabricated so that it finds particular utility as a means for electrospray ionization of analytes for mass spectrometer analysis. Electrospray is achieved by subjecting the nozzle **50** to a voltage so that liquid and analytes (the "sample") emerge to a high electric field. For this particular application, the microfluidic device **10** includes a conductive region **70** formed on at least a portion of the nozzle **50** and optionally, the conductive region can extend onto the second surface **24**. For example, the area around each nozzle **50** up to the extreme end of the nozzle **50** is metallized by evaporation techniques, printing techniques, or other suitable techniques known in the art to form the conductive region **70**. Because the nozzle **50** in the illustrated embodiment has a conical shape, the conductive region **70** takes the form of a ring-shaped metal layer with the nozzle **50** being in the center thereof. The thickness of the conductive region **70** can vary depending upon the precise application; however, the conductive region **70** should have a sufficient thickness so that when an electric voltage is applied to the conductive region **70**, the sample material (i.e., a liquid) within the microfluidic channel vaporizes and therefore can be used in electrospray or nanospray applications, such as electrospray ionization of analytes for a mass spectrometer. The microfluidic device **10**, in this example, provides a low cost, disposable electrospray interface capable of nanospray. This device can be fabricated to accommodate more than one sample input in order to multiplex several separation instruments to a single mass spectrometer.

[**0041**] Each of the conductive regions **70** formed around the nozzles **50** is connected to one or more electrical contacts **80** formed at one edge of the substrate body **20**. More specifically, the electrical contacts **80** are preferably in the form of conductive pads (i.e., metallized tabs) that are formed on the second surface **24** of the substrate body **20**. **FIG. 3** shows one exemplary method of electrically connecting the conductive regions **70** with the electrical contacts **80**. In this exemplary arrangement, one conductive region **70** is electrically connected via an electrical pathway **90** to one electrical contact **80**. The electrical pathway **90** simply provides an electrical pathway between the conductive region **70** and the electrical contact **80** and is therefore formed of a conductive material (e.g., a metal). For example, the electrical pathway **90** can be in the form of a thin conductive film. By reducing the outside diameter of the tip portion **52** of the nozzle **50** (e.g., to about 50 μm to 80 μm), the voltage required to generate the spray is lowered. According to one exemplary embodiment, the voltage used to form the spray is about 5-6 KV for a tip portion **52** having an outside diameter from about 50 μm to 80 μm. It will be appreciated that larger sized outside diameters can be used; however, this will require a greater voltage to be applied to the nozzle **50** in order to form a spray.

[**0042**] It will be appreciated that more than one conductive region **70** can be electrically attached to one electrical contact **80** using separate electrical pathways **90** or using a network of electrical pathways or a complete metal film. However, in this embodiment, when an electric voltage is applied to the one electrical contact **80**, the electric voltage is applied to each of the conductive regions **70** that is electrically connected to the one electrical contact **80**. Thus, the electric voltage can not be selectively delivered to individual nozzles **50** in this particular embodiment.

[**0043**] Now referring to FIGS. **4**-**5**, an exemplary microfluidic device **100** according to a second embodiment is illustrated. The microfluidic device **100** is similar in some respects to the microfluidic device **10** of FIGS. **1**-**3**. The microfluidic device **100** includes a substrate body **110** that is formed of a polymeric material and includes a first face **120** and a second opposing face **130**. Unlike the embodiment illustrated in FIGS. **1**-**3**, the first and second faces **120**, **130** are not substantially planar surfaces but rather are non-planar in nature due to each of the faces **120**, **130** having a number of recesses and protrusions formed therein.

[**0044**] The microfluidic device **100** has at least one microfluidic channel **140** formed therein between the first face **120** and the second face **130** such that the microfluidic channel **140** extends completely through a thickness of the substrate body **110** from the first face **120** to the second face **130**. The microfluidic channel **140** is thus open at both a first end **142** at the first face **120** and at a second end **144** at the, second face **130**. The first face **120** includes a first perimeter wall **122** that extends around a perimeter of the microfluidic device **100** at the first face **120** thereof. In the exemplary embodiment, the microfluidic device **100** is generally square shaped; however, this is merely one exemplary shape for the microfluidic device **100** as the microfluidic device **100** can assume any number of different shapes. Within the boundary of the first perimeter wall **122**, one or more reservoir walls **124** are formed with the number of reservoir walls **124** equal to the number of microfluidic channels **140** formed in the substrate body **110**. Each reservoir wall **124** partially defines a reservoir **160** that is designed to hold a sample material and the reservoir wall **124** therefore also defines the first end **142** of the microfluidic channel **140**. Both the first perimeter wall **122** and the one or more reservoir walls **124** extend above a generally planar surface **126** (i.e., a floor) of the first face **120** in this embodiment. A substantial portion of reservoir