shape, a frustoconical shape, or another, similar shape with tapered sidewalls. The arrows in **FIGS. 3 and 4** illustrate exemplary directions of fluid flow through channel 18 as a sample or sample solution encounters a mixing structure **24**. While the mixing structures **24** depicted in **FIGS. 3 and 4** include features that extend at least partially along the heights of their respective channels **18**, mixing structures with features that extend from the sides of channels **18** are also within the scope of the present invention, as are mixing structures that include combinations of features that extend at least partially along the height and width of a channel **18**.

[**0041**] **FIGS. 5 through** 6B depict various examples of the manner in which enlarged regions **22** of channel **18** may be configured. Specifically, **FIGS. 5 and** 5A depict examples of the manner in which side walls **23, 23**' of each enlarged region **22** may be oriented. **FIGS. 6 through** 6B depict exemplary types of corrugation **27, 27', 27"** that may be employed along a ceiling **25** of at least an enlarged region **22** of a channel **18** of a microfluidic platform that incorporates teachings of the present invention.

[**0042**] As shown in **FIG. 5**, one or more enlarged regions **22** may include sidewalls **23** that are oriented substantially perpendicular to a major plane of microfluidic platform **10**. **FIG. 5A** illustrates an example of an enlarged region **22** that includes a tapered side wall **23'**. While side wall **23'** tapers outwardly from a ceiling **25** of enlarged region **22** to a first surface **14** of microfluidic platform **10** (i.e., enlarged region **22** is smaller at ceiling **25** than at first surface **14**), tapering may occur in the opposite direction. Further, while **FIG. 5A** depicts tapering of side walls **23'** as being substantially linear, such tapering may be stepped and/or curved. Alternatively, an enlarged region **22** may have somewhat convex or concave side walls. These and other nonperpendicular configurations of side walls **23, 23'** may be used either with or without mixing structures **24 (FIGS. 3 and 4)**.

[**0043**] Nonperpendicular configurations of the side walls **23, 23'** of enlarged regions **22** that are within the scope of the present invention may enhance the reaction kinetics between an analyte in a sample or sample solution and capture molecules **56** of a specific binding assay apparatus **50 (FIGS. 12 and 13)** with which microfluidic platform **10** is used. For example, tapering side walls **23'** of enlarged regions **22** in the manner that is shown in **FIG. 5A** may force a sample or sample solution downward to a location of lesser resistance to flow (i.e., the more open location adjacent to first surface **14** of microfluidic platform **10**, thereby increasing the likelihood that analyte therein will contact and, thus, be bound by capture molecules **56** that are exposed to an enlarged region **22** of microfluidic platform **10**.

[**0044**] **FIGS. 6 through** 6B depict various examples of enlarged regions **22** of a channel **18** of a microfluidic platform **10** that incorporates teachings of the present invention with ceilings **25** that comprise corrugations **27, 27', 27"**, respectively. As shown, corrugations **27, 27', 27"** extend at least somewhat transversely to the direction in which a sample or sample solution will flow through enlarged region **22**. Thus, corrugations **27, 27', 27"** may extend in a direction which is substantially perpendicular to the general direction in which a sample or sample solution will flow through enlarged region **22**. Corrugations **27, 27', 27"** may be linear or they may be somewhat curved, sinusoidal, V-shaped, zig-zagged, or otherwise configured. As shown in **FIG. 6**, corrugations **27** may comprise elongate members that extend downward from ceiling **25** and substantially across enlarged region **22**. **FIG. 6A** depicts rectangular corrugations **27'** that have a more robust configuration. The corrugations **27"** that are illustrated in **FIG. 6B** comprise a sinusoidal configuration across ceiling **25** of enlarged region **22**. Corrugations **27, 27', 27"** may be used alone or in combination with one or both of tapered side walls **23, 23'** and mixing structures **24**.

[**0045**] Corrugations **27, 27', 27"** may increase folding within a sample or sample solution, thereby enhancing the reaction kinetics between an analyte in a sample or sample solution and capture molecules **56** of a specific binding assay apparatus **50 (FIGS. 12 and 13)** with which microfluidic platform **10** is used.

[**0046**] Microfluidic platforms **10** that incorporate teachings of the present invention may be formed separately from a substrate that comprises specific binding assay apparatus **50 (FIGS. 10 and 11)** and subsequently assembled therewith and secured thereto, or they may be formed on or integrally with a specific binding assay apparatus **50**.

[**0047**] An exemplary embodiment of a method for fabricating a microfluidic platform **10** is depicted in **FIGS. 7 through 10**. **FIGS. 7 and 8** depict fabrication of a mold **110**, or master, while **FIGS. 9 and 10** illustrate the formation of a microfluidic platform **10** and assembly thereof with a specific binding assay apparatus **50**.

[**0048**] In **FIG. 7, a** substrate **100** with a substantially planar surface **102** is provided. By way of example only, substrate **100** may comprise a full or partial wafer of silicon or another semiconductor material, or a glass or ceramic structure, or any other suitable substrate material. A layer **104** that includes photoimageable material is applied to substantially planar surface **102** in a desired thickness. By way of example only, the photoimageable material of layer **104** may comprise a photoresist, such as SU-8 2025, available from MicroChem Corp. of Newton, Mass. The photoimageable material may be applied to substantially planar surface by spin coating (e.g., spinning substrate **100** at 1000 rpm for 30 seconds for a layer **104** thickness of about 70 μm to about 85 μm) or any other suitable process.

[**0049**] Additional preparation processes may also be conducted on layer **104**. In the example of a photoresist, a soft bake process may be conducted at a temperature (e.g., 65° C. and 95° C.) and for a period of time (e.g., 12 minutes total, including 3 minutes at 65° C. and 9 minutes at 95° C.) to evaporate solvent and to densify the photoresist. Of course, these parameters may be prespecified for the type of photoresist being used (in this case SU-8 2025) and the thickness of layer **104** thereof (in this case about 70 μm to about 85 μm).

[**0050**] Next, as shown in **FIG. 8**, selected regions **106** of the photoimagable material of layer **104** are at least partially cured to form at least one elongate, nonlinear protrusion **108** on substantially planar surface **102**. Continuing with the photoresist example, selective curing may be effected by use of a dark field mask, which is useful with negative photoresists. The photoresist may be exposed to an appropriate dose of radiation, as known. In the case of a layer **104** that includes SU-8 2025 and has a thickness of about 70 μm to about 85 μm, an exposure dose of about 500 to about 600