

CLAIMS

WHAT IS CLAIMED IS:

1. A method for forming a microfluidic device, comprising:
 - a) providing a microfluidic structure and a film;
 - b) treating a surface of said microfluidic structure, a surface of said film, or both with a solvent;
 - c) subsequent to (b), pressing said microfluidic structure together with said film under a first heating condition to form said microfluidic device comprising said solvent; and
 - d) applying a negative pressure to said microfluidic device under a second heating condition, which negative pressure is applied for a time period greater than 30 minutes or at a pressure less than 20 kilopascals (kPa) to remove at least a portion of said solvent from (b).
2. The method of claim 1, wherein said microfluidic structure comprises a microchannel, a plurality of microchambers, a plurality of siphon apertures, or any combination thereof.
3. The method of claim 1, wherein said treating comprises application of one or more solvents.
4. The method of claim 3, wherein said one or more solvents include a solvent selected from the group consisting of isopropyl alcohol, acetone, ethyl alcohol, hexanes, cyclohexane, toluene, and benzene.
5. The method of claim 1, wherein said pressing comprises applying a force of at least about 0.5 kilo-Newtons (kN).
6. The method of claim 1, wherein said first heating condition comprises heating to a temperature of at least about 60 °C.
7. The method of claim 1, wherein said applying said negative pressure comprises applying a pressure less than about 7 kPa.
8. The method of claim 1, wherein said second heating condition comprises heating said microfluidic device to a temperature of at least about 70 °C.
9. The method of claim 8, wherein said heating said microfluidic device to a temperature of at least about 70°C removes at least about 75% of said solvent from said microfluidic device.
10. The method of claim 1, wherein said applying said negative pressure comprises applying said negative pressure for at least about 2 hours.
11. The method of claim 1, wherein said applying said negative pressure removes at least about 50 % of said solvent from said microfluidic device.

12. The method of claim 1, wherein said applying said negative pressure under said second heating condition reduces separation between said microfluidic structure and said film.
13. The method of claim 1, wherein said microfluidic structure comprises a channel or chamber with a feature size of at most about 500 micrometers.
14. The method of claim 1, wherein said removing said solvent increases a yield of a microfluidic device generation process by at least about 25%.
15. The method of claim 1, wherein said microfluidic device has a usable feature fraction of at least about 0.5.
16. The method of claim 1, further comprising applying an increased pressure to said microfluidic device, wherein said increased pressure is sufficient to expel at least a portion of said solvent.