

Patterning of Superhydrophobic Paper Surfaces

A 2D microfluidic device with “sticky” regions for containing and mixing fluids

Inventors at Georgia Tech have fabricated a flexible superhydrophobic, roll-off, paper with “sticky” regions to control the storage, mobility, and transport of liquid drops for microfluidic applications. The roll-off paper is prepared by plasma etching regular paper. Patterns are printed onto the roll-off paper using a desktop printer to create “sticky” regions, regions of variable adhesive force where fluid can be held in place or mixed. These “sticky” regions on the non-sticky roll-off surfaces allow for precise control and confinement of fluid drops through the pattern printed on the paper.

Summary Bullets

- **Versatile** – allows for flexibility of paper and any array of “sticky” dots and lines
- **Simpler** – space saving alternative to three-dimensional microfluidic products
- **Cheaper** – made using paper and simple application process for “sticky” regions

Solution Advantages

- **Versatile** – allows for flexibility of paper and any array of “sticky” dots and lines
- **Simpler** – space saving alternative to three-dimensional microfluidic products
- **Cheaper** – made using paper and simple application process for “sticky” regions
- **Environmentally Friendly** – made using paper, a renewable biopolymer
- **Cleaner** – self-cleaning properties of the “roll-off” paper help to prevent contamination

Potential Commercial Applications

This technology has use in many diagnostic applications and any application where sterile mixing is required, including:

- Lab-on-chip devices
- Personal diagnostic kits
- Relief-aid diagnostic kits and medical equipment

Background and More Information

Lab-on-a-chip, or microfluidic devices, are highly sought after in life sciences research and diagnostic applications. Current devices are either bulky and three dimensional or lack the ability to confine fluids to a specific area for testing. Thus, there is a need for a device with a simple design that is able to confine fluids to a specific area.

Inventors

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Publications

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Images

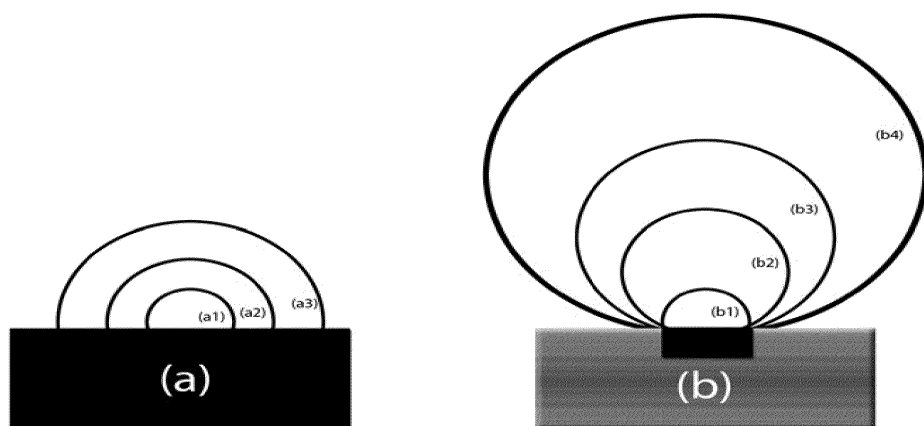


FIG. 3

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<https://s3.sandbox.research.gatech.edu/index.php/print/pdf/node/3530>