

NISTTech

Surface Charge Modification within Preformed Polymer Microchannels with Multiple Applications Including Modulating Electroosmotic Flow & Creating Microarrays

Micro-total-analytical system having a polymeric substrate with a fluid flow channel

Description

Micro-total-analytical systems, referred to as μ TAS or lab-on-a-chip devices, have been increasingly researched. The technology is based on the use of a series of microfluidic channels or microchannels for the movement, separation, reaction and/or detection of various chemicals. Although the lab-on-a-chip devices have progressed rapidly in the past decade, there still remain several issues with the technology. The majority of these issues stems from the need to control flow and/or immobilized reagents within the fluid flow channels. This patent presents a method of modifying fluid flow in a channel formed in a polymeric substrate. Additionally, it provides a method of immobilizing a chemical species in a channel formed in a polymeric substrate. Finally, the invention further provides a micro-total-analytical system having a polymeric substrate with a fluid flow channel. All of these advantages eliminate all the previous issues with micro-total-analytical systems.

Applications

- **Fabrication and modification of microfluidic devices**
Creates or reformats various lab-on-a-chip devices.

Advantages

- **Flow control**
Allows for controlled flow and the ability to immobilize reagents with the use of polymeric substrates.

Abstract

A method for modifying and controlling fluid flow in channels formed in substrates. The method involves exposing a portion of a fluid flow channel to light at a fluence which modifies the surface charge of the substrate at the exposure site. The method can be used to immobilize chemical compounds or biological species in the fluid flow channels at the modified surfaces. The method can be used to fabricate or modify microfluidic systems.

Inventors

- Johnson, Timothy J.
- Locascio, Laurie E.
- Ross, David J.
- Waddell, Emanuel A.

Related Items

- Article: NIST Chemists Define and Refine Properties of Plastic Microsystems

References

- US Patent # 6,982,028 issued , expires 11/29/2022
- Docket: 01-011US

Status of Availability

This invention is dedicated to the public domain. Collaborative research opportunities are available. Patent still active.

Last Modified: 01/14/2010