Micro-Fluidic Device for the Creation of a Hand-Held Portable Water Sensor

Advantage

- Rapidly senses water impurities
- Inexpensive, portable hand-held device
- Used for real-time on-site water testing
- Provides inert polymer packaging for any micro-fluidic sensor

Invention

The invention provides an easy to fabricate interconnecting, one-piece micro-fluidic package, for interlocking configurations and combinations of sensor components.

U.S. Issued Patents: 7,666,285
Related U.S. Issued Patents: 7,569,127 | 7,988,902 | 8,057,724

Background

Micro-fluidics, or “lab-on-a-chip” technology, is experiencing explosive growth in the fields of chemistry, biology, electronics and computers. These devices are small (approximately 1cm) sensors capable of determining microbe growth in water, chlorine content, water purity, temperature and a variety of other parameters. These sensors work by allowing liquids and gases to flow through them providing constant contact with the material of interest. This allows for continuous monitoring with a minimal sample volume.

Engineers and scientists at UCF have developed a method for creating a portable water quality sensor. This method makes use of inert polymers for the consistent packaging of an electrode (sensor) layer, microbial layer and micro-fluidic inlet and outlet ports. These sensors would work as disposable cartridges for use with portable hand-held monitors. With this technology a flexible array of devices can be created for monitoring all the parameters of water quality. These include chlorine content, temperature and microbe levels via biological oxygen demand (BOD). Integrated with the device are an inexpensive, durable, chemically inert substrate and a temperature sensor. In addition, it takes into account all thermal effects on the chlorine concentration. Due to its rapid feedback and portability, this device can be deployed on site for real time water quality detection.

Application

This portable device could be utilized for monitoring pools and municipal drinking water. The underlying technology would be of interest to environmental agencies, state, federal or private water treatment facilities and any company interested in selling water testing kits for at home use.

Lead Inventor

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Selected References