

Impedance-Based Gas Detector

Microchannels

A low-cost, fast-responding electrical sensor detects potentially fatal gas bubbles in conductive fluids within microchannels, offering a vital safety and monitoring solution for medical applications like hemodialysis.

Fluidic microchannels are found in many biological systems and provide high rates of heat and mass transfer in organs such as the brain, lungs, liver and kidneys. Currently, these microchannels are frequently used for treating certain medical conditions; however, there is critical need to detect and avoid bubbles in the blood to prevent air embolisms during medical applications, a potentially fatal complication.

Researchers at Purdue University have developed technology that can detect gas bubbles in microchannels coated with polyethylene oxide (PEO) and dielectric microchannels carrying a conductive fluid. Output signals from the low-cost and fast-responding electrical sensor can be used to monitor the fluid flow in the small-scale channel. This technology could have a significant impact on medical applications such as hemodialysis.

Advantages:

- Gas void fraction detection applicable at the microscale
- Relatively inexpensive to implement
- Prevent air embolisms

Potential Applications:

- Medical/Health
- Hemodialysis

TRL: 4

Intellectual Property:

Technology ID

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Category

Biotechnology & Life
Sciences/Analytical & Diagnostic
Instrumentation

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