



Biphasic Ion Detection

Using water-immiscible phase to detect ions in small-volume samples

At home diagnostic tests, such as blood electrolyte detection and blood calcium detection, have been on the rise with the market expected to reach \$8.15 Billion in 2030 [\[source\]](#). A problem with current blood detection tests is that a large volume of blood sample is needed (tens of microliters or above). This is a problem when the sample is precious or hard to collect. One example is fingerstick blood testing, in which only several microliters of blood is collected.

The technology

Researchers at VCU have developed a biphasic method to mix, separate, and optically detect ions inside a sample in a highly sensitive manner without optical interference from the blood itself. This process uses a water-immiscible liquid, inexpensive materials, and specific mixing technique to make ion detection highly sensitive and low-cost for the user. The required sample volume is typically below 5 microliters. By utilizing a specific mixing technique within this process, no hemolysis of blood samples is induced. This biphasic method can be applied to become an all-in-one, compact machine to detect ions in a sample.

Benefits

- » High sensitivity
- » Low sample volume
- » No hemolysis

Applications

- » At home diagnostic tests

Patent status:

Patent pending

License status:

This technology is available for licensing to industry for further development and commercialization.

Category:

Engineering and Physical Science

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