Method and Device for Separating Particles By Size

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method of using ultrasound to separate mixed particles of different sizes for applications such as integrated protein bioassays.

OVERVIEW

The need for integrated protein bioassays has led to a proliferation of assays involving antibodies immobilized on beads. A variety of techniques have been developed to separate particles by size; however, these methods have a number of limitations, including cost, power or voltage requirements, sample volume requirements, difficulty of manufacture, complex construction, moving parts, measurement quality, reliability and response time.

THE INVENTION

UW-Madison researchers have developed a method and device for separating mixed particles of different sizes by using ultrasound. The invention achieves bead chromatography (separation by size) by using acoustic radiation force in an ultrasonic actuator. First, a mixture of particles is focused at the nodes of a standing pressure wave in a vessel such as a glass capillary. Then, an inertial, nonlinear force generated by transverse vibrations in the vessel separates the particles by size.

APPLICATIONS

• Integrated protein bioassays
• May be useful for ambulatory applications or disposable assay systems

KEY BENEFITS

• Compatible with any assay in which antibodies are immobilized on beads
• Requires less than five volts for operation
• Consumes only about 10 milliwatts
- Takes seconds to perform separation
- Easy to manufacture
- No need for moving parts, which reduces cost and improves reliability
- Operation can be portable, using batteries or other low-power sources.
- Compatible with CMOS (complementary metal oxide semiconductor) battery operation

ADDITIONAL INFORMATION

Tech Fields
Research Tools - Synthesis & purification

CONTACT INFORMATION

For current licensing status, please contact Mark Staudt at mstaudt@warf.org or 608-960-9845.