

Differential Weighing of Individual Microparticles

A differential diffractometry device provides highly precise, comparative measurements of microparticle mass for research, medical testing, and diagnostics.

Using microcantilevers to weigh target entities is a widely known and commonly used method. Measurements are made by observing changes in the microcantilevers resonance frequency when weighing target entities; however, this method does not provide differential measurements. Differential measurements are critical for comparing two samples to one another and comparing a weighted sensor to its weight when unloaded. Differential measurements help to reduce unwanted disturbances that affect the sensors, such as the binding of stray particles that are not targeted for detection.

Researchers at Purdue University have developed a device for obtaining differential measurements of target entities on a microweight scale. Using differential diffractometry, this device allows highly precise measurements of mass in the picogram range. This technique could be used to compare diseased and normal cells or cells that have been subjected to different chemical treatments, and it allows for the determination of their difference in mass. It also allows for calculations to determine effective volume or density of target particles.

Advantages:

- Highly precise differential measurements
- Directly compare two microparticle masses

Potential Applications:

- Research & Development
- Medical testing
- Diagnostic testing

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Category

Biotechnology & Life
Sciences/Analytical & Diagnostic
Instrumentation

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