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Aerodynamic Lenses Optimized For Nanoparticles

IP Status: Issued US Patent; **Application #:** 11/269,932

Aerodynamic Lenses Optimized For Analyzing Very Small Nanoparticles

Aerodynamic lenses are commonly used with mass spectrometers. The lenses take particles suspended in a carrier gas and focus them into collimating beams. Then, a series of apertures remove the particles that become scattered from the main beam. Due to the natural diffusion of small particles away from the main portion of the beam, current aerodynamic lenses are not effective for particles smaller than 20mm.

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Optimized Aerodynamic Lenses Creates Collimating Beams

The aerodynamic lenses uses an optimized design criteria that reduces the effects of diffusion and takes into account such things as spacing between apertures, pressure of carrier gases, the length of lens, etc. The resulting aerodynamic lens improves the sampling efficiency of molecules by a factor of 100. This allows for proteins that are as small as 3nm to be focused in a collimating beam and analyzed in mass spectrometers. These lenses have potential applications in chemical analyzers, mass spectrometers for proteomics research, particle deposition systems, cluster beam systems, and cluster beam deposition.

FEATURES AND BENEFITS OF THE AERODYNAMIC LENS FOR COLLIMATING BEAMS OF NANOPARTICLES:

- Focuses smaller (3-30 nm)nanoparticles compared to current aerodynamic lenses (20 nm and greater)
- Aerodynamic lens allows for more tightly collimated beams
- Allows proteins (~ 3 nm) and other large molecules that are normally too small to be analyzed directly in mass spectrometers
- Increases sampling efficiency of molecules by a factor of 100

Technology ID
z05056

Category
Engineering & Physical Sciences/Instrumentation, Sensors & Controls
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