SOLE SOURCE JUSTIFICATION

PURCHASE AND SUPPLY OF IZON SCIENCE'S NANOPORES

OVERVIEW

Nanopores from Izon Science Limited are the only tunable apertures capable of measuring nanoparticle size, concentration and zeta potential in the world, when used in combination with Izon's Tunable Resistive Pulse Sensing (TRPS) instruments (the Exoid, or its predecessor – the qNano). Izon's nanopores have several unique capabilities that are necessary for biological nanoparticle research, development and quality assurance. The underlying analytical method of TRPS enables measurements of individual particles. This allows subpopulations of complex and dispersed samples to be resolved.

TRPS combines the principle of resistive pulse sensing with tunable pores. Tunable stretch, pressure and voltage across the nanopore enables users to directly measure and monitor the physical properties of individual particles (40 nm – 11 µm) in solution. The correct particle size distribution, concentration and zeta potential (defined across a size range) can be measured on a particle-by-particle basis for a wide range of particle types. Traceable calibration with certified particles of a known size and concentration serves as a built-in validation step, enabling highly reproducible and reliable measurements.

The combined use of pressure and electrophoresis allows highly precise and accurate multi-parameter measurements that are not available with other systems. Users can control particle movement and velocity through the tunable nanopore via fine control of electric current and/or pressure-driven mechanisms at variable stretches, thus offering detailed, multi-dimensional descriptions of particles in solution. The true value of the nanopore comes from this ability to tune the applied stretch, allowing nanoparticles across a wide size range to be characterised on a single aperture.

SPECIFICATIONS

Zeta Potential

- Nanopores can be used to analysis particles in the size range of 40 nm - 2000 nm
- Electrolyte molarity: 10 - 300 mM

Particle Size

- Particle size range detectable: 40 nm to 11 µm
- Particle types: synthetic and biological particles

Sample Concentration in Particles/mL

- Particle concentration is reported over a defined particle size range (particles/mL)
- Concentration range: 10^5 - 10^{11} particles/mL (Note: this is dependent on nanopore size).

Electrolyte

- A wide range of complex electrolyte solutions, such as PBS, HEPES, MES, KCl and serum can be used.
- Electrolyte strength: 2 - 1000 mM. The operation of larger nanopores NP800 and above requires a lower molarity electrolyte.

Sample Volume

- A minimum of 35 µL of sample diluted to appropriated concentration is required.

User Manuals and Supporting Documentation

- Information on use of the nanopore is provided in Izon's TRPS instrument User Manuals, which can be found alongside other supporting documentation at support.izon.com

Expiry

- Nanopores have a shelf life of 24 months from the date of manufacture.

Shipment

- The nanopore is of a cruciform shape with dimensions of 68 x 50 mm, sold in a 50 x 70 mm Ziplock bag, weight <2 g.