SPHERO™ Paramagnetic and Superparamagnetic Particles

- SPHERO™ Magnetic Microparticles provide high quality and reproducible results for your application
- Allow for rapid and reliable binding between the target and magnetic particle
- Consists of a uniform, monodispersed surface for optimal performance.

The SPHERO™ Magnetic Particles (Paramagnetic Particles) are prepared by coating a layer of iron oxide and polystyrene onto polystyrene core particles. The SPHERO™ Magnetic Particles are relatively uniform in size, spherical in shape and paramagnetic in nature. The paramagnetic nature of the particles allows them to be separated using a magnet and resuspended easily when removed from the magnet. They do not retain any significant magnetism even after repeat exposure to strong magnetic fields. For the maximum uniformity, of shape and size Spherotech offers SPHERO™ High Uniform Magnetic Particles in the 1 and 3 μm size range.

The SPHERO™ Smooth Surface Magnetic Particles have a thick layer of polymer coating on the surface of the particles to fully encapsulate the iron oxide coating. There is no exposed iron oxide on the surface of the particles. These particles are paramagnetic. The SPHERO™ Smooth Surface Magnetic Particles are particularly useful in applications where exposed iron oxide may interfere with the enzymatic activities or cause other undesirable interferences. The SPHERO™ Magnetic Particles are used for cell separation, affinity purification, DNA probe assays, magnetic particle EIA, etc.

The SPHERO™ High Iron Superparamagnetic and Silica Magnetic Particles have significantly greater magnetite content (~40%). The large surface area combined with higher magnetite content make SPHERO™ High Iron Magnetic Particles ideal solid phase for use in cell separation, magnetic removal of microorganisms, viruses and cross reactants in serum, as well as, affinity purification applications.

SPHERO™ Silica Magnetic Beads are designed to binds RNA and DNA in the presence of chaotropic reagents or under mild acidic buffer conditions. They are positively charged and bind the negatively charged nucleic acids. In addition, they can be used with a variety of organosilane chemistry approaches to modify the surface of magnetic of the silica magnetic bead.

The SPHERO™ Cross-linked Magnetic Particles are prepared to render them resistant to common organic solvents such as acetone, acetonitrile, DMF and chloroform. Uniform diameters between 1 to 100 micron are available.
SPHERO™ Silica High Iron Nano Superparamagnetic Particles

- SPHERO™ Silica Superparamagnetic nanoparticles are Fe₃O₄ magnetic beads coated with a silicon dioxide (SiO₂) layer
- Provides silanol groups to form stable siloxane linkages which are then used with a variety of organosilane chemistry approaches to modify the surface
- Useful in an array of applications such as covalent immobilization of proteins (e.g. antibodies, enzymes), peptides, nucleic acids or other molecules of interest
- Used to purify DNA or RNA under high concentration of chaotropic salts.

<table>
<thead>
<tr>
<th>Particle Type and Surface</th>
<th>Size, μm</th>
<th>% w/v</th>
<th>Catalog No.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica Superparamagnetic</td>
<td>0.1-0.39</td>
<td>2.5</td>
<td>SIM-025-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Silica Superparamagnetic</td>
<td>0.4-0.69</td>
<td>2.5</td>
<td>SIM-05-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Silica Superparamagnetic</td>
<td>0.7-0.9</td>
<td>2.5</td>
<td>SIM-08-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Silica Superparamagnetic</td>
<td>1.0-1.4</td>
<td>2.5</td>
<td>SIM-10-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Amino Silica Superparamagnetic</td>
<td>0.1-0.39</td>
<td>2.5</td>
<td>ASIM-025-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Amino Silica Superparamagnetic</td>
<td>0.4-0.69</td>
<td>2.5</td>
<td>ASIM-05-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Carboxyl Silica Superparamagnetic</td>
<td>0.1-0.39</td>
<td>1.0</td>
<td>CSIM-025-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Carboxyl Silica Superparamagnetic</td>
<td>0.4-0.69</td>
<td>1.0</td>
<td>CSIM-05-10H</td>
<td>10 mL</td>
</tr>
<tr>
<td>Epoxy Silica Superparamagnetic</td>
<td>0.1-0.39</td>
<td>1.0</td>
<td>ESIM-025-5H</td>
<td>5 mL</td>
</tr>
<tr>
<td>Epoxy Silica Superparamagnetic</td>
<td>0.4-0.69</td>
<td>1.0</td>
<td>ESIM-05-5H</td>
<td>5 mL</td>
</tr>
<tr>
<td>Aldehyde Silica Superparamagnetic</td>
<td>0.1-0.39</td>
<td>1.0</td>
<td>GLSIM-025-5H</td>
<td>5 mL</td>
</tr>
<tr>
<td>Aldehyde Silica Superparamagnetic</td>
<td>0.4-0.69</td>
<td>1.0</td>
<td>GLSIM-05-5H</td>
<td>5 mL</td>
</tr>
<tr>
<td>Azide Silica Superparamagnetic</td>
<td>0.1-0.39</td>
<td>1.0</td>
<td>AZSIM-025-5H</td>
<td>5 mL</td>
</tr>
<tr>
<td>Azide Silica Superparamagnetic</td>
<td>0.4-0.69</td>
<td>1.0</td>
<td>AZSIM-05-5H</td>
<td>5 mL</td>
</tr>
</tbody>
</table>

RNA Isolation
Blood, Cells, Tissue, Bacteria, Yeast
Lysis

Plasmid Isolations
Bacterial cells
Lysis

PCR
Template Preparation
Blood, Cells, Tissue, Lysis

Viral NA isolation
for (RT)-PCR
Blood, Serum, Plasma
Lysis

Precipitation of Chromosomal DNA

- Collect bead
- Remove Supernatant
- Wash with buffer (2x)

Addition of Silica beads and binding buffer to matrix

Centrifuge or magnetic separation

- Add elution buffer and collect nucleic acid

Centrifuge or magnetic separation

- PCR
- UV Spectroscopy
- Agarose electrophoresis

Silica Magnetic Beads DNA Purification Principle