

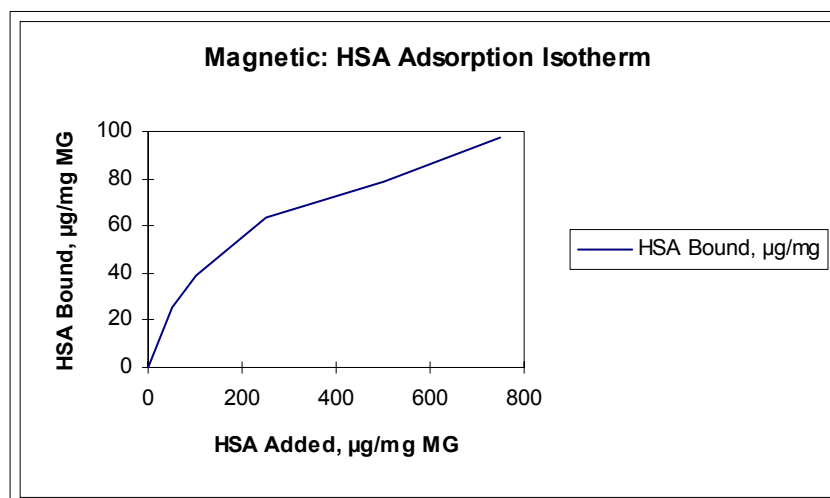
Coupling Procedures

Sera-Mag™ magnetic particles have carboxylic acid groups on the surface permitting easy covalent coupling using carbodiimide chemistry. They are stable in a variety of conditions including deionized water, high salt, surfactants, pH 5 to 10, and low concentrations of DMF or DMSO. Some organic solvents (such as acetone, MEK, or aromatic solvents) may dissolve Sera-Mag™ magnetic particles.

Sera-Mag™ magnetic particles are designed for **covalent coupling only**. For applicable coupling procedure, please consult our “Recommended Adsorption and Covalent Coupling Procedures”.

Total bound protein may be assayed according to the procedure given in our “Microparticle-bound Protein Assay” bulletin. (Note: The covalently bound protein procedure in this bulletin is not recommended for use with Sera-Mag™ magnetic particles.)

The following graph shows Human Serum Albumin (HSA) binding to Sera-Mag™ magnetic particles, according to our recommended procedures.



Coupling

Adsorption was performed with MES buffer, 25 mM, pH 5.5 without EDAC. Normally, proteins do not adsorb to the surface of Sera-Mag™. The data here shows that HSA can be “forced” on to the surface by using MES buffer and a low pH:

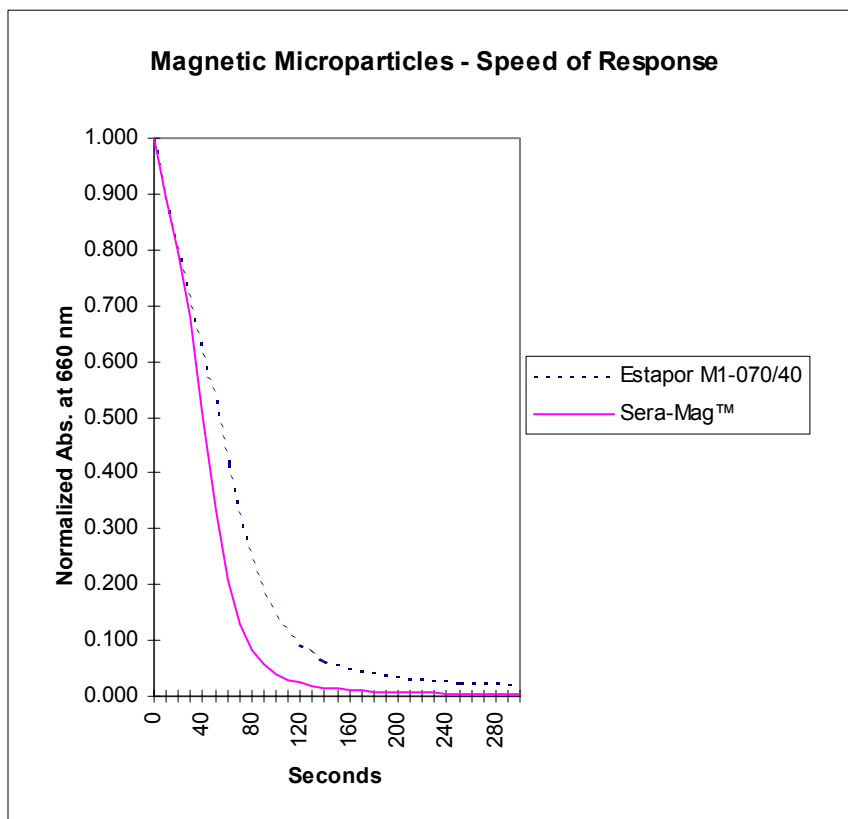
- Proteins do not adsorb non-specifically to Sera-Mag™
- Sera-Mag™ have a high protein binding capacity
- HSA can be “forced” onto the surface during binding reactions

These characteristics are very important and will help to prevent unexpected problems under normal assay conditions.

Magnetic Response and Handling

In the absence of any magnetic field, no significant sedimentation takes place in one hour. In a magnetic field, total separation of a 1.5 OD_{650nm} suspension in a 1 cm x 1 cm cuvette is obtained in less than two minutes. For this test, a spectrophotometer was fitted with a special cell holder which housed a rare earth magnet. A reading was taken at time zero and every 10 seconds thereafter. The following is a graph of the results for non-sensitized particles. Water was used as the reference. It should be noted that solution conditions and microparticle modifications have a great effect on speed of magnetic response. In general, conditions that increase the colloidal stability will decrease the magnetic response rate. For example, increasing pH will slow the response rate while coating the particles with protein will cause it to increase. Raising the buffer viscosity will also slow the response rate.

Particles may be repeatedly separated by a magnetic field and redispersed with no residual magnetism.



Magnetic Response

The graph also illustrates an important phenomenon. Both particles start out with the same rate of magnetic separation, however, Sera-Mag™ continues with a quick separation due to its uniform size distribution. Estapor's large particles move quickly in the first few seconds, however, the smaller particles (due to the wide size distribution) move much more slowly at the end of the graph. Due to the tight size distribution, Sera-Mag™ particles offer a faster and more uniform separation of the particle suspension.

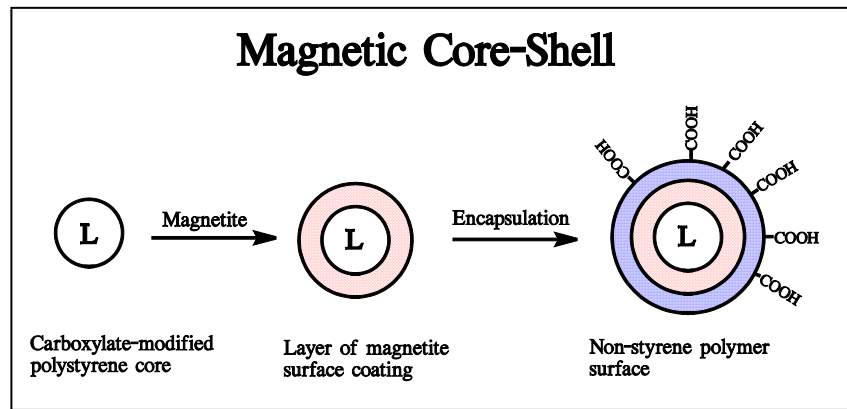
Magnetic Particle Technical Data

Nominal Dia.	Size Dist.	Magnetite Content	Density (g/ml)	Mag. Sat. EMU/g	Acid Cont (meq/g)	Park Area ($\text{\AA}^2/\text{COOH}$)
1 μM	$\pm 5\%$	40%	1.5	25	0.5	2

These are nominal values. A certificate of analysis will be enclosed with each order that includes specific lot analysis. Pasteurization, 90 °C cycling and autoclaving are not recommended. An alcohol gradient may be used for contamination control.

EMU/g is a measure of induced magnetism in the presence of a strong magnetic field. In other words, it is a measure of the magnetic responsiveness of the particle. The value of 25 EMU/g for Sera-Mag™ is significantly greater than comparable magnetic particles which typically have a values equal to or less than 15.

Seradyn Magnetic Microparticle Process



Ordering Sera-Mag® Magnetic Microparticles

Sera-Mag™ Magnetic Microparticles

(Nominal diameters - 5% solids concentration, 0.05% sodium azide)

1 μM	15ml	Part No.	2415-2105-050290
1 μM	100ml	Part No.	2415-2105-050390
1 μM	1000ml	Part No.	2415-2105-050490

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You are cordially invited to visit our facilities any time you are in the Indianapolis area. We are just minutes from the Indianapolis International Airport. Please inquire about our other exceptional microparticle products. We have a complete range of microparticles to suit your individual requirements.

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For technical help, call the Particle Technology Division or write, e-mail or fax to the address below. We'll be glad to help you in any way we can.

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