

TECHNICAL DATA SHEET 410

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Protein Coupling Reagents

Description

The concept of binding globulin to polystyrene latex developed by Singer and Plotz¹ has led to the use of these microspheres in agglutination tests for diagnostic purposes. When antibody - coated microparticles are mixed with a solution of the specific antigen, the microparticles will agglutinate. Similarly, antigen - coated microparticles will agglutinate in the presence of the corresponding antibody. Detection of agglutination can be accomplished by visual inspection, which is facilitated by dyed particles. Detection can also be accomplished with the use of various instrumental measurements, such as turbidimetric and nephelometric measurements, angular dissymmetry, quasi - elastic light scattering and particle counting.²

The simplest method of attaching proteins to microparticles is by passive adsorption. Passive adsorption is adequate for most short - term applications, but the adsorbed proteins may gradually desorb. However, some passively adsorbed proteins have been reported to be stable for at least two months.³

Increase Shelf Life by Covalent Coupling

Various methods have been developed for the covalent linking of proteins to microspheres via functional groups on the surface of the microspheres.^{4,5} In these methods, the functional groups on the surface of the beads are activated prior to the coupling of proteins.

For example, carboxylated groups are activated by using a carbodiimide derivative⁶ and amino groups are activated by glutaraldehyde.⁷ ⁸ Once proteins are covalently attached to microparticles, desorption is minimal even after two years if the coupled microparticles are stored at 4°C in the presence of a preservative like sodium azide.

Match Reagents and Beads from One Source

Polysciences can serve as the complete source of reagents needed for coupling proteins to microparticles. Protocols for passive adsorption of proteins to polystyrene beads (Technical Data Sheet #238E), covalent coupling of proteins to carboxylated beads (Technical Data Sheet #238C) and covalent coupling of proteins to blue dyed and amino functionalized beads (Technical Data Sheet #238D) are available upon request. In addition, we offer two kits for covalently attaching proteins to microparticles. One kit contains buffers and other reagents for coupling proteins to carboxylated beads (Cat. # 24350), while the other kit contains buffers and other reagents for coupling proteins to blue dyed and amino functionalized beads (Cat. # 19540). The contents of each kit are sufficient for coupling proteins to at least fifty 0.5ml samples (2.5% solids) of beads. A detailed instruction sheet is enclosed with each kit. These instruction sheets are also available upon request (Technical Data Sheet #644 - Instruction Sheet for Cat. # 24350; Technical Data Sheet #238G - Instruction Sheet for Cat. #19540) or by visiting our website at www.polysciences.com.

Immuno beads - Precoupled with Proteins

Polysciences also offers immuno beads and magnetic immuno beads for research purposes. The immuno beads are carboxylated polystyrene beads, fluorescent carboxylated polystyrene beads and blue dyed polystyrene beads of 1µm diameter covalently coupled with protein A and antibodies. The magnetic immuno beads are called Colloidal Magnetite Particles (50nm diameter) and Micro Magnetite Particles (1µm diameter) covalently coupled with protein A and antibodies. For a complete list of immuno beads, magnetic immuno beads and other microspheres, write for Technical Data Sheet #238, download the Technical Data Sheet from our website or see our current catalog. Agglutination slide tests and immunofluorescence slides are also available from Polysciences. We can also couple proteins or microspheres of your choice on a custom basis. Write or call us for quotes.

References

1. **Singer, J.M., R.M. Plotz.** 1971. *Am J Med*, 31: 766.
2. **Looney, C.J.** 1984. *Immunoassay*, 7(1).

3. **Von Schulthess, C., et al.** 1982. U.S. Patent No. 4,350,677.
4. **Masson, P.L., et al.** in *Methods in enzymology* (J.T. Langone, ed.).
5. **Bangs, L.B.** 1987. *Am Biotech Lab*, May/June: 10.
6. **Daniel, J.C.** 1977. U.S. Patent No. 4,064,080.
7. **Galvin, J.P.** 1983. *Diag Immunology Assessment (C.A.P.)*.
8. **Goodfriend, T.L., et al.** 1964. *Science*, 144: 1344.

This product is for research use only and is not intended for use in humans or for *in vitro* diagnostic use.

Ordering Information

| Cat. # | Description | Size |
|--------|--|-----------------------|
| 24350 | PolyLink Protein Coupling Kit for COOH Microspheres | 1 kit |
| 24818 | PolyLink Protein Coupling Kit with Hollow Fiber Filtering System | 1 kit |
| 19540 | Glutaraldehyde Kit for Amino and Blue Dyed beads | 1 kit |
| 23964 | Glutaraldehyde Kit with Hollow Fiber Filtering System | 1 kit |
| 18208 | Agglutination Test Slides (2 x 4.25") | box of 50 |
| 00006 | Boric Acid | 2kg |
| 00455 | N,N'-Dicyclohexylcarbodiimide | 100g |
| 05288 | 1-Ethyl-3(3-dimethylaminopropyl)-carbodiimide hydrochloride (EDC) | 5g or 25g |
| 01909 | Glutaraldehyde, 25% EM Grade | 100ml amp (10 x 10ml) |
| 00084 | Glycerol, U.S.P. | 1kg |
| 18357 | Immunofluorescence slides (25 x 75mm, one end frosted; 10 x 6mm dia. wells) | Box of 100 |
| 00398 | Sodium phosphate, dibasic | 500g |
| 00400 | Sodium phosphate, monobasic | 500g |

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