Datasheet for ABIN1721103

MagSi-S COOH 600 beads

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Overview

Quantity:	10 mL
Target:	Carboxyl
Application:	Separation (Sep)

Product Details

Purpose:	Superparamagnetic silica particles with a carboxyl modified surface. Intended for carbodiimide coupling chemistry with NH2-containing molecules.
Specificity:	Coating chemistry: Carboxyl Bead concentration: 8 - 20 x 10^9 beads/mL
Characteristics:	MagSi-Tools are surface activated magnetic particles, intended for covalent immobilization of proteins (e.g. antibodies, enzymes), peptides, nucleic acids or other molecules of interest. Different surface modifications and bead sizes allow for choosing the optimal product for the right molecule to be coupled, and for the intended application. Please take into consideration which groups are available on the ligand for coupling, and try to prevent inactivation or hiding the active or exposed site of the ligand. After coupling the molecule of interest (ligand) is coupled to the magnetic particles, the resulting beads can be used in downstream applications such as: - Isolating specific target proteins, antibodies, nucleic acids, cells, viruses, etc. (preparative applications) - Detecting specific target proteins, nucleic acids, cells, viruses, etc. (diagnostic applications) - Immobilizing enzymes, thereby enhancing stability and minimizing auto-catalysis. Magnetic collection of the particle/enzyme complex allows to remove the enzyme from the reaction, and to reuse it in a new reaction.

Product Details

Components:	Magnetic silica beads with activated surface
Material not included:	Buffers and Materials (depending on the application) Magnetic separator for bead separation/collecting Mixer/vortex to homogenize samples and resuspend beads (depending on the application)
Bead Ligand:	Carboxyl modified surface
Bead Matrix:	Superparamagnetic Silica particles
Bead Size:	Bead size: 600 nm

Target Details

Target:	Carboxyl

Application Details

Protocol:	Magnetic beads are an ideal tool for immobilizing molecules (proteins, enzymes, antibodies, peptides, nucleic acids, etc.) on a solid phase, to be used for e.g. detecting, enriching, or cleaving specific target molecules. The easy and efficient collection of beads in magnetic fields allows for easy rinsing and removal of excess reagents and ligand after coupling the ligand molecule, as well as easy use in downstream applications. The use of magnetic beads does not require columns or centrifugation steps, and are therefore ideal in high-throughput and automated applications **Bead size** Our magnetic beads come in three sizes, 600 nm, 1 µm and 3 µm. 600 nm beads have the advantage of having a larger surface area and the sedimentation time of 600 nm MagSi beads is approximately 4 times slower than that of 1.0 µm beads. This allows longer incubation times without shaking/mixing, and may be important in automated and other high-throughput applications in which shaking/mixing options are often lacking. MagSi beads with a diameter of 3 µm have stronger magnetic properties and will separate approximately 4x faster than 600 nm beads under same conditions: approximate separation time is ≥ 1 minute using a suitable magnet.
Restrictions:	For Research Use only

Handling

Format:	Liquid
Concentration:	10 mg/mL
Buffer:	Stored in PBS, 0.05% sodium azide
Preservative:	Sodium azide
Precaution of Use:	This product contains sodium azide: a POISONOUS AND HAZARDOUS SUBSTANCE which should be handled by trained staff only.
Handling Advice:	Store beads in well closed vial and in upright position to prevent drying of the beads since this makes them more difficult to re-suspend. Do not freeze the product! Vortex bead suspension well before use. If you expect iron interference in downstream applications, we strongly advise you to rinse the beads before usage. Before using the beads it is important to rinse with water or PBS to remove any components that could interfere with your test.
Storage:	4 °C
Expiry Date:	12 months

Images

Table 2: Coupling chemistries and conditions for different MagSi-Tools

Bead Surface	Chemicals needed	Protein binding	Treatment	Comments
Carboxyl [1] (COOH)	EDC/NHS	Amine groups (from lysine and/or as unblocked N-termini) Lysine, histidine, cysteine, tyrosine etc.	No treatment needed	Can be used to couple most proteins
Aldehyde (CHO)	Aldehyde/ Amine reaction	Amine groups	No treatment needed	Add reducing agent to stabilize amide bond
Thiol (SH)	Redox reaction [3]	Free cysteine	Reduce disulphides under non-denaturing conditions to generate free cysteins.	Useful for proteins containing cysteines. Risk of multiple coupling
Amine [2] (NH2)	Gluteral-dehyde	Amine/ aldehyde	No treatment needed	Add reducing agent to stabilize amide bond
Tosyl	None	Sulfhydryl, Amine groups	No treatment needed	Useful for antibodies
Hydrazide	Sodium periodate	Oligosacharide moieties	Oxidize glycoprotein under non-denaturing conditions.	Useful for glycoproteins
Epoxy	Adsorption/ reaction support	Lysine, histidine, cysteine, tyrosine etc.	No treatment needed	Useful for enzymes

[1] The first step is to activate the functional groups with N-hydroxysuccinimide in order of creating a highly reactive succinimide ester which reacts with amine groups contained in protein.

[2] Gluteraldehyde gives more stable protein binding than the carbodiamide reagents used with carboxylate beads.

Abbreviations: EDC, N-ethyl-N'-(dimethylaminopropyl) carbodiimide; NHS, N-hydroxysuccinimide.

3 Reduction of disulfides with 0.1 M DTE (dithioerythrol); coupling of protein at pH below iso-electric point; deactivate excess thiol with 20 mM PDEA (2-(2-pyridinyldithio) ethane-amine)/ 1M NaCl, pH 4,3

Image 1.

Surface activation	Formula	Example Applications
Silica (stored in 0.05% sodium azide)	Si-OH	- End-users' own application (e.g. functionalization of the MagSi beads)
Carboxyl (stored in PBS, 0.05% sodium azide)	R-COOH	- Protein and peptide immobilization - Antibody immobilization
Aldehyde (stored in PBS, 0.05% sodium azide)	R-CHO*	- Protein immobilization
Amine (stored in 0.05% sodium azide)	$R\text{-}NH_2$	- Protein immobilization
Sulfydryl (stored in PBS, 0.05% sodium azide)	R-SH*	- Immobilization via target cysteine groups, coupling to gold surfaces
Tosyl (stored in DSMO:THF 1:1)		- Antibody immobilization - Protein and peptide immobilization
Hydrazide (stored in PBS, 0.05% sodium azide)	$R\text{-}CO\text{-}N_2H_2$	- Glycoprotein immobilization - Protein and peptide immobilization
Epoxy (stored in DSMO:THF 1:1)		- Enzyme immobilization - Protein and peptide immobilization

* coupling of other organic molecules, such as nucleic acids or carbohydrates, is also possible. CHO- and SH-beads have a limited stability, and must be used for coupling ligand within 2-3 weeks after production.

Image 2. Active surfaces and example applications of MagSi-tools