Datasheet for ABIN1721104

# MagSi-S Epoxy 1.0 beads

2 Images

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## Overview

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|---|---|
| Quantity: | 2 mL |
| Target: | Epoxy |
| Application: | Separation (Sep) |

## Product Details

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|---|---|
| Purpose: | Superparamagnetic silica particles with epoxy modified surface. Intended for epoxy coupling chemistry to enzymes and other NH2 containing molecules. |
| Characteristics: | Coating chemistry: Epoxy<br>Bead concentration: 6 - 12 x 10^9 beads/mL |
| Components: | Magnetic silica beads with activated surface |
| Material not included: | Buffers and Materials (depending on the application)<br>Magnetic separator for bead separation/collecting<br>Mixer/vortex to homogenize samples and resuspend beads (depending on the application) |
| Bead Ligand: | Epoxy modified surface |
| Bead Matrix: | Magnetic Silica particles |
| Bead Size: | 1 µm |

## Target Details

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|---|---|
| Target: | Epoxy |

## Application Details

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|---|---|
| Comment: | 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.<br>After coupling the molecule of interest (ligand) is coupled to the magnetic particles, the resulting beads can be used in downstream applications such as:<br>- Isolating specific target proteins, antibodies, nucleic acids, cells, viruses, etc. (preparative applications)<br>- Detecting specific target proteins, nucleic acids, cells, viruses, etc. (diagnostic applications)<br>- 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. |
| 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<br><br>**Bead size**<br><br>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

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|---|---|
| Format: | Liquid |
| Concentration: | 10 mg/mL |
| Buffer: | Stored in DSMO:THF 1:1 |
| 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.<br>Do not freeze the product!<br>Vortex bead suspension well before use.<br>If you expect iron interference in downstream applications, we strongly advise you to rinse the beads before usage.<br>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 |

## Validation report #029687 for ELISA (ELISA)

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 cysteine. | 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 carbodiimide reagents used with carboxylate beads.

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

3 Reduction of disulfides with 0.1 M DTE (dithioerythral); 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<br>- 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<br>- Protein and peptide immobilization |
| Hydrazide (stored in PBS, 0.05% sodium azide) | $R\text{-}CO\text{-}N_2H_2$ | - Glycoprotein immobilization<br>- Protein and peptide immobilization |
| Epoxy (stored in DSMO:THF 1:1) |  | - Enzyme immobilization<br>- 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