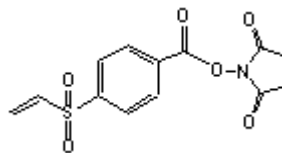


SVSB - Heterobifunctional crosslinkers Amine and Sulphydryl reactive

Product Description

Catalog number: UPL7738A, 50mg
Name: SVSB
Formula : Succinimidyl-(4-vinylsulfonyl)benzoate
 $C_{13}H_{11}NSO_6$, M.W.= 309.29



Storage : +4°C (possible at -20°C), protect from moisture and light. (L)

Introduction

Cross-linkers are chemical reagents used to conjugate molecules together by a covalent bond. Several atoms separate the 2 molecules, forming the 'spacer arm'. The conjugate associates the characteristics and biological activities of each component.

Cross-linkers have become important tools for the preparation of conjugates used in a lot of immunotechnologies, and for protein studies (structure, interactions, activity, degradation...). **Heterobifunctional** cross-linkers present 2 identical reactivities. The choice of the reactivities is determinant to the design of the right conjugate. SVSB crosslinker reacts toward amines, through the succinimide group, and toward sulfhydryl, through the vinylsulfone group.

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Scientific and Technical Information

- The chemical group N-hydroxysuccinimide (NHS) reacts in aqueous phase on primary ($-NH_2$) and secondary amines ($=NH$) (in fact on its deprotonated form), optimally at neutral pH or higher : amines present in proteins (Lys amino acid) and in a lower proportion on NH_2 located in terminal peptidic chains. The reaction occurs in few minutes in organic media at room temperature, and also in aqueous buffers but in competition with hydrolysis, that increases with pH, and with the high dilutions of the molecule that should be coupled. The reaction with amines occurs typically at pH 6.5-8.5 in 1 hour. n-Hydroxysuccinimide is released and should usually be removed before use of the conjugate.
- The vinylsulfone moiety is well stable in aqueous buffers ([Mornureo 1996, Masri 1988](#)). Unlike maleimides, it forms with free SH a stable thioether linkage by Michael addition that does not produce stereoisomers. As a result, the formed conjugate contains a single stereoisomer, allowing to have more defined conjugates. These features make this compound more convenient to use and better for some applications (structure studies) than other crosslinkers.
- Vinylsulfone is a slightly softer electrophile than maleimide. Sulfhydryl addition to vinylsulfones generates a stable β -thiosulfonyl linkage (4). Sulfhydryl modification with vinylsulfones has the advantage that the vinylsulfone itself is stable in aqueous solution for days at pH 9.01, thus allowing extended reaction times for modification without hydrolysis. Sulfhydryl addition to vinylsulfone, unlike maleimides, does not generate stereoisomers which in some instances may complicate analysis and/or bioactivity of the conjugate.
- The spacer arm of SVSB measures 8.3 Angstroms length. SVSB is water insoluble, and should thus be solubilized first in organic solvent as DMF or DMSO. Uptima recommends not to store the working solution because traces of water or air humidity may lead to NHS hydrolysis.

Examples of protocols are given in the literature. As guidelines, here is an example of Vinylsulfone labeling of RNase1:

- prepare RNase (1.35 mg/mL) in 0.2 M, pH 8.0 borate buffer.
 Reduction of RNase: 14 mg protein ($M_r=13,700$) dissolved in 300 mL of 25 % β -mercaptoethanol in 4.5 M guanidinium chloride. Heat 100 °C/5 min. The reduced protein (four cystine disulfide bonds reduced to eight cysteine thiol groups) is isolated by gel filtration chromatography using 0.05 M Tris, 0.2 M guanidinium chloride pH 4.3.
- Vinylsulfone in DMF (10 mg/mL) stock solution is added to RNase at 22 °C.
- Reaction is allowed to proceed until optimum modification is achieved (1-2.5 h).

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FT-UPL7738

- Quench aliquotes with 1.5 M β-mercaptoethanol prior to analysis.
- Product is desalted by gel filtration.

Other information regarding NHS reactivity are available ([NT-NHS](#): buffers, conditions of use...).

Other Information

For use *in vitro* only, not for diagnostic.

For any information, please contact Uptima, or your local distributor.

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Literature: SVSB

UPL7738 Masri, M.S., et.al. (1988) *J. Protein Chem.* 7, 49-54

UPL7738 Morpurgo, M., et.al. (1996) *Bioconjugate Chem.* 7, 363-368

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