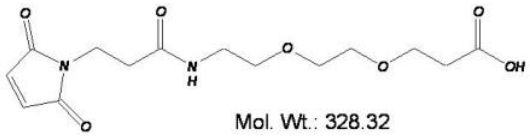
FT-AZ4170

# Maleimido PEO acids

*Chemical modifiers to convert sulfhydryls (SH) groups to carboxyls (COOH); Building block*

## Products Description

| **Product name**<br>cat.number | **MW**<br>($g \cdot mol^{-1}$) | Spacer | |
|---|---|---|---|
| **Maleimide-$PEO_2$-COOH**<br>AZ4170, 100mg<br>AZ4172, 1g<br>CAS : 756525-98-1<br>Syn. : MAL-$(EG)_2$-COOH | **328.32** | |  |
| **Maleimide-$PEO_4$-COOH**<br>FV0820, 100mg<br>FV0822, 1g | **416.42** | | |
| **See also** | | | + |

**Store**: at +4°C (L), protect from moisture. R: 36/37/38, S: 26-36

These Maleimide derivatives modify sulfhydryl groups (SH) and introduce a terminal carboxy one (COOH) that can be used (i.e. by activation with NHS) for further coupling or labeling applications. These Maleimide derivatives are available with several spacer lengths, including the hydrophilic PEO spacer.

**Applications**:
- Modification of SH group or insertion of COOH for conjugations purposes: immobilisation, conjugation, labeling
- change the biomolecule properties (anionisation, polarity, SH blocage)

I.e.

.Peptides or nucleotides can be grafted onto various supports as gels for chromatography, resin for synthesis (Vreeland 2002). Proteins can be activated for coupling to any reporter molecule.

.One might search to change the biomolecule properties (add anionic charges, modify the polarity), or to block SH groups that could give interferences in downstream reactions. This may be useful also in protein structure and protein interactions studies.

Ask Uptima for other high quality modifiers and crosslinkers to answer the needs of coupling proteins and peptides for biotechnologies, biological assays, and immunoassays.

# Technical Information

Allow vial to warm to room temperature before opening.

- The **maleimide** group reacts very specifically with sulfhydryls at neutral pH 6.5-7.5, forming a stable thioether link. The reaction is rapid (a few minutes for cystein), but may require 1-2 hours to be completed in certain conditions (up 4H at +4°C). The competitive hydrolysis forming maleamic acid becomes noticeable when pH go up 8.0, where the reactivity with amines begins to be possible. It is stable in 0.1 M phosphate, pH 7.0, 4 °C, for 64 h (Yoshitake 1979) . In usual conditions, one should start with a ratio of 10-20 moles of maleimide per mole of protein. With SH-peptides, a molar 1:1 incubation ratio allows almost 1:1 coupling.
- **PEO spacer** (the arm separating the maleimide and carboxyl groups) is a hydrophilic non-cleavable structure, available in several length. Longer spacers lower steric hindrance of conjugates partners and favours interactions with other ligands. PEO spacer confer not only similar advantages but hydrophilicity to the conjugates:
  **Increase**s **water solubility of crosslinker, ***of conjugates or conjugates/ligands complexes
  **Increases stability*: reduced aggregation** of conjugates
  **Increases biocompatibility***: **non-immunogenic, non-toxic**
  **Increases availability** *: conjugate more hydrophilic and bioactive
  **Reduces non-specific binding on surfaces**
  Perfectly defined unique structure (discrete PEG)
- The carboxyl groups can further react with amines/hydrazides. COOH can effectively be activated with carbodiimides (as EDAC, UP52005) for conjugation to amines from proteins.

Protocols can be found in the literature.

## Literature

Biochem. Soc. Trans. **11**, 753 (1983)
Griffiths D.G., et al., FEBS Lett. **134**, 261 (1981)
Hermanson G.T. Bioconjugate Techniques, pp. 284, 416. (1996)
Keller O., J. Rudinger, Helv. Chim. Acta **58**, 531 (1975)
Meredith, G. D., Wu, H. Y., Allbritton, N. L. (2004) Bioconjugate Chem. 15, 969-982.
Moroder L., et al.,, Biol. Chem. Hoppe-Seyler **368**, 855 (1987)
Moroder L., et al.; Immunoassays of peptide hormones and their chemical aspects. biopolymers **22,** 481-486. (1983).
Rich D., Gesellchen, P.D., Tong, D., Cheung, A. & Buckner, C.K. Alkylating derivatives of amino acids and peptides. Synthesis of N-maleoylamino acids, [1-(N-maleoylglycyl)cysteinyl]oxytocin. Effects on vasopressin-stimulated water loss from isolated toad bladder. J. Med. Chem. **18,** 1004-1010. (1975)
Vreeland Wyatt N., Gary W. Slater, and Annelise E. Barron; Profiling Solid-Phase Synthesis Products by Free-Solution Conjugate Capillary Electrophoresis, American Chemical Society 2002 (Article)
Wünsch E., et al., Biol. Chem. Hoppe-Seyler **366**, 53 (1985)

## Other Information

For in vitro R&D use only

## Related products and documents

See BioScience web page, and e-search tool.

- BioSciences Catalogue > Biochemistry chapter > conjugation : modifiers and crosslinkers (C7, C19, C27):

- Maleimide-PEO$_x$-Amine #FK3521
  Maleimide-PEG$_x$-COOH #WU0760
  Maleimido – PEO – acids & NHS esters #B41ZK1
  Maleimido-PEOn-Acids #AZ4170
  2-Maleimidoethyl amine #BI1191
- Carbodiimides FT-52005A: EDAC #520059, DCC (N,N'-dicyclohexylcarbodiimide) #HG9911
- DTT #054721
- SATA #84235A, Iminothiolane #42425A
- SMCC-hydrazide #BI1281

Please contact Uptima – Interchim for any other information

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