



SIGMA-ALDRICH

3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone 800-325-5832 • (314) 771-5765
Fax (314) 286-7828
email: techserv@sial.com
sigma-aldrich.com

Product Information

Bacitracin zinc salt from *B. lichenformis*

Product Number **B5150**
Storage Temperature 2-8 °C

Product Description

Molecular Formula: C₆₆H₁₀₃N₁₇O₁₆S (Bacitracin A)
Molecular Weight: 1422.7 (Bacitracin A)
CAS Number: 1405-89-6
Melting Point: 221-225 °C
Isoelectric point: pI = 8.8 (Messing's method),
8.5 (electrophoresis)¹
pH of 1% solution = 6-7²
Extinction Coefficient: E^{mm} = 6.25 (225 nm),
2.50 (252 nm)⁴
Fluorescent Properties:
Excitation wavelength: 292 nm¹
Emission wavelength: 325 nm¹

Commercial bacitracin is a mixture of at least 9 isoforms, of which bacitracin A is the major component.³ Bacitracin is a polypeptide complex produced by *Bacillus subtilis* and *Bacillus lichenformis*, and is used as an antibacterial agent, primarily against Gram-positive organisms.³ Bacitracin inhibits bacterial cell wall synthesis by inhibiting dephosphorylation of lipid pyrophosphate.¹³ Articles pertaining to bacitracin and its mechanism of action have been reported^{1,14,15,16,17,18} and several methods for preparation and preparation of peptide fragments have been published in the literature.^{5, 6, 7, 8, 9, 10}

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in 1 N HCl (50 mg/ml), yielding a clear to hazy solution. The solubility of Bacitracin has been discussed in the literature.^{1,11} Bacitracin is very soluble in water and methanol; soluble in ethanol; slightly soluble in acetone, benzene, and ether; and practically insoluble in chloroform, ether, and acetone.^{3,12}

Storage/Stability

Aqueous solutions degrade rapidly at room temperature.³ Bacitracin is relatively stable in acidic solutions and unstable above pH 9.¹² An observed loss in activity is probably due to transformation of Bacitracin A into Bacitracin F, which has a low antimicrobial activity.³

References

1. Analytical Profiles of Drug Substances, Vol. 9, Brewer, G. A., Academic Press (New York, NY: 1980), pp. 1-69.
2. Martindale The Extra Pharmacopoeia, 29th ed., Reynolds, J. E. F., ed., The Pharmaceutical Press (London, England: 1989), p. 128.
3. The Merck Index, 12th ed., Entry# 965.
4. Galardy, R. E., et al., Tritium-hydrogen exchange of bacitracin A. Evidence for an intramolecular hydrogen bond. *Biochemistry*, **10(13)**, 2429-2436 (1971).
5. Munekata, E., et al., Synthetic studies of bacitracin. VIII. Synthesis of cyclohexapeptide moiety. *Bulletin of the Chemical Society of Japan*, **46**, 3187-3193 (1973).
6. Munekata, E., et al., Synthetic studies of bacitracin. IX. Synthesis of peptide fragments for bacitracins of cycloheptapeptide formula. *Bulletin of the Chemical Society of Japan*, **46**, 3835-3839 (1973).
7. Porath, J., *Acta Chem. Scand.*, **6**, 1237 (1952).
8. Chaiet, L., and Cochrane, T. J. Jr., U.S. Pat. 2,915,432, Merck & Co. (1959).
9. Johnson, B. A., and Meleney, F. L., U.S. Pat. 2,498,165, U. S. Secy. of War (1950).
10. Freaney, T. E., and Allen, L. P., U.S. Pat. 2,828,246, Commercial Solvents (1958).
11. Weiss, P. J., et al., *Antibiot. Chemother.*, **7**, 374 (1957).

12. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), pp. 318-319.
13. Siewert, G., and Strominger, J. L., Bacitracin: an inhibitor of the dephosphorylation of lipid pyrophosphate, an intermediate in biosynthesis of the peptidoglycan of bacterial cell walls. Proceedings of the National Academy of Sciences, **57**, 767 (1967).
14. Storm, D. R., Mechanism of bacitracin action: a specific lipid-peptide interaction. Ann. N. Y. Acad. Sci., **235(0)**, 387-398 (1974).
15. Craig, L. C., et. al., in Ciba Foundation Symposium on Amino Acids and Peptides with Antimetabolic Activity, Wolstenholme, G. E. W., and O'Connor, C. M., eds., Little and Brown (Boston, MA: 1958), pp. 226-246.
16. Weinberg, E. D., in Antibiotics, Gottlieb, D., and Shaw, P. D., eds., Springer-Verlag (New York, NY: 1967), pp. 90-99.
17. Weinberg, E. D., in Antibiotics, Gottlieb, D., and Shaw, P. D., eds., Springer-Verlag (New York, NY: 1967), pp. 240-245.
18. Storm, D. R., and Toscano, W. A. Jr., in Antibiotics, vol. 5, pt. 1, Hahn, F. E., ed., Springer-Verlag (New York, NY: 1979), pp. 1-17.

AGW/RXR 5/06

Sigma brand products are sold through Sigma-Aldrich, Inc.

Sigma-Aldrich, Inc. warrants that its products conform to the information contained in this and other Sigma-Aldrich publications. Purchaser must determine the suitability of the product(s) for their particular use. Additional terms and conditions may apply. Please see reverse side of the invoice or packing slip.