

48760 Gentamicin sulfate from *Micromonospora purpurea*

CAS number: 1405-41-0

Synonyms: Gentamycin, Garamycin,

Physical properties:

Molecular Formula 1:

Gentamicin C₁: C₂₁H₄₃N₅O₇

Gentamicin C₂: C₂₀H₄₁N₅O₇

Gentamicin C_{1a}: C₁₉H₃₉N₅O₇

MW (free base) 1:

Gentamicin C₁ = 477.6 g/mol

Gentamicin C₂ = 463.6 g/mol

Gentamicin C_{1a} = 449.5 g/mol

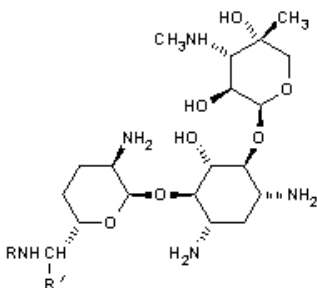
Appearance: White to white with yellow cast powder

Melting Point: 218-237 °C¹

$[\alpha]_{546}^{20} = +130 \pm 8^\circ$ (c = 1 in water)⁴

$[\alpha]_D^{20} = +110 \pm 8^\circ$ (c = 1 in water)⁴

~ 700 U/mg 1 U entspricht 1 myg des Gentamicin-sulfat Referenz-Standards gem. USP



Gentamicin_	R	R'
C ₁	= CH ₃	CH ₃
C ₂	= H	CH ₃
C _{2a}	= H	H

Gentiomycin C

Gentamicin is an aminoglycoside antibiotic complex produced by fermentation of *Micromonospora purpurea* or *M. echinospora*.¹

It is a mixture of three major components designated as C₁, C_{1a} and C₂ and is used as the sulfate salt.

Each component consists of five basic nitrogens and requires five equivalents of sulfuric acid per mole of gentamicin base.³

Gentamicin sulfate is a broad spectrum antibiotic. It inhibits the growth of a wide variety of gram-positive and gram-negative microorganisms including strains resistant to tetracycline, chloramphenicol, kanamycin and colistin, particularly strains of *Pseudomonas*, *Proteus*, *Staphylococcus* and *Streptococcus*.^{3,6}

It is bactericidal at concentrations two to three times higher, but in some cases bacteriostatic concentrations are also bactericidal.⁸

Gentamicin sulfate inhibits bacterial protein biosynthesis by binding to the 30S subunit of the ribosome.^{6,7}

The recommended working concentration for eukaryotic cell culture is 50 µg/mL, and for prokaryotic cells 15 µg/mL.⁴

Preparation Instructions:

Gentamicin sulfate is freely soluble in water. It is practically insoluble in alcohol and other organic solvents.² Sigma routinely tests the solubility at 50 mg/mL in water yielding a clear to very slightly hazy, colorless to faint yellow solution. Sterile solutions of gentamicin sulfate should be stored at 2-8 °C. Solutions of gentamicin were shown to be stable when stored at room temperature, and in boiling aqueous buffers of pH 2 to 14.² A solution at 1 mg/mL in 0.1 M potassium phosphate buffer pH 8.0, stored at 2-8 °C, should be used within 30 days.³

Gentamicin sulfate solution may be sterilized by filtration. Sterile solutions should also be stored at 2-8 °C and will be stable for up to 2 years.⁴

A 4% solution in water yields a pH of 3.5-5.5.⁵

Storage/Stability

Storage Temperature 2-8 °C

References:

1. Merck Index, 11th ed., 686-687, #4284 (1989).
2. Rosenkrantz, B.E. et al., *Analyt. Profiles of Drug Substances*, 9, 295-340 (1980).
3. USP National Formulary, 16th ed., 1162 (1985).
4. Fluka data.
5. Martindale: The Extra Pharmacopoeia, 30th ed., 169 (1993).
6. Korzybski, T. et al., *Antibiotics*, vol. I, 712-723 (1978).
7. Lorian, V., *Antibiotics In Lab. Med.*, 694-696 (1986).