48760 Gentamicin sulfate from *Micromonospora purpurea*

**CAS number:** 1405-41-0  
**Synonyms:** Gentamycin, Garamycin, Gentiomycin C

**Physical properties:**

- **Molecular Formula 1:**
  - Gentamicin C₁: \( C_{21}H_{43}N_5O_7 \)
  - Gentamicin C₂: \( C_{20}H_{41}N_5O_7 \)
  - Gentamicin C₁a: \( C_{19}H_{39}N_5O_7 \)

- **MW (free base) 1:**
  - Gentamicin C₁ = 477.6 g/mol
  - Gentamicin C₂ = 463.6 g/mol
  - Gentamicin C₁a = 449.5 g/mol

- **Appearance:** White to white with yellow cast powder
- **Melting Point:** 218-237 °C

\( \left[ \alpha \right]_{D}^{20} \) = +130 ± 8° (c = 1 in water)  
\( \left[ \alpha \right]_{D}^{20} \) = +110 ± 8° (c = 1 in water)  
~ 700 U/mg

1 U entspricht 1 myg des Gentamicin-sulfat Referenz-Standards gem. USP

Gentamicin is an aminoglycoside antibiotic complex produced by fermentation of *Micromonospora purpurea* or *M. echinospora*. It is a mixture of three major components designated as C₁, C₁a 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.

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

Gentamicin sulfate inhibits bacterial protein biosynthesis by binding to the 30S subunit of the ribosome.

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

**Preparation Instructions:**

Gentamicin sulfate is freely soluble in water. It is practically insoluble in alcohol and other organic solvents. 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. 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.
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.  

A 4% solution in water yields a pH of 3.5-5.5.

**Storage/Stability**

Storage Temperature 2-8 °C

**References:**

4. Sigma-Aldrich data.

**Precautions and Disclaimer:**

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.