



Meropenem, USP PRODUCT DATA SHEET

issue date 12/10/2019

| | |
|--------------------------------------|---|
| Product Name: | Meropenem, USP |
| Product Number: | M002 |
| CAS Number: | 119478-56-7 |
| Molecular Formula: | $C_{17}H_{25}N_3O_5S \cdot 3H_2O$ |
| Molecular Weight: | 437.52 |
| Form: | Powder |
| Appearance: | almost white or yellowish crystalline powder |
| Solubility: | sparingly soluble in aqueous solution (5.63 mg/ml) |
| Source: | Synthetic |
| Water Content (Karl Fischer): | 11.4-13.4% |
| pH: | 4.0 - 6.0 |
| Optical Rotation: | -17.0° to -21.0° |
| Storage Conditions: | 2-8 °C |
| Description: | <p>Meropenem is a β-lactam antibiotic in the carbapenem class, and targets the bacterial cell wall. It has found utility against extended spectrum β-lactamase (ESBL) producing <i>Enterobacteriaceae</i> that are resistant to many first line β-lactam antibiotics and certain cephalosporins. Meropenem is sparingly soluble in aqueous solution.</p> <p>We also offer:</p> <ul style="list-style-type: none">• Meropenem with sodium carbonate (<u>M028</u>) |
| Mechanism of Action: | <p>β-lactams interfere with PBP (penicillin binding protein) activity involved in the final phase of peptidoglycan synthesis. PBP's are enzymes which catalyze a pentaglycine crosslink between alanine and lysine residues providing additional strength to the cell wall. Without a pentaglycine crosslink, the integrity of the cell wall is severely compromised and ultimately leads to cell lysis and death. Resistance to β-lactams is commonly due to cells containing plasmid encoded β-lactamases. Like many carbapenems, meropenem is highly resistant to the degradative effects of β-lactamases.</p> |
| Spectrum: | <p>Meropenem is a broad-spectrum antibiotic targeting a wide range of bacteria especially those causing meningitis.</p> |

Microbiology Applications Meropenem is commonly used in clinical *in vitro* microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against Gram-positive and Gram-negative microbial isolates. Meropenem has also shown high potency against high-resistant superbug strains. Medical microbiologists use AST results to recommend antibiotic treatment options. Representative MIC values include:

- *Staphylococcus epidermidis* 0.06 µg/mL - 16 µg/mL
- *Neisseria meningitis* 0.002 µg/mL – 0.03 µg/mL
- For a complete list of Meropenem MIC values, [click here](#).

Media Supplements

Meropenem can be used as a selective agent in several types of isolation media:

VRE Medium - VRE Selective Supplement

Plant Biology Applications

Meropenem can be used to suppress the overgrowth of *Agrobacterium* in tobacco, tomato, and rice transformation, with 25 mg/L suppressing outgrowth (Ogawa and Mii , 2007).

Meropenem suppressed growth of *Agrobacterium* during transformation of *Phalaenopsis* at 5 mg/L and had no phytotoxic effect on the cells themselves (Sjahril and Mii, 2005).

References:

Guzmán F(2008) Beta lactams antibiotics (penicillins and cephalosporins) mechanism of action. *Med. Pharmacol.* Pharmacology Corner, 29 Nov. 2008

Ogawa Ya and Mii M (2007) Meropenem and moxalactam: Novel B-lactam antibiotics for efficient *Agrobacterium*-mediated transformation. 172(3):564-572

Pitout JD, Sanders CC, Sanders WE (1997) Antimicrobial resistance with focus on beta-lactam resistance in gram-negative bacilli. *Am J Med* 103:51

Sjahril R and Masahiro Mii M (2006) High-efficiency *Agrobacterium*-mediated transformation of *Phalaenopsis* using meropenem, a novel antibiotic to eliminate *Agrobacterium*. *J. Hort. Sci and Biotechnol* 8(3):458-464

Yang Y, Bhachech N and Bush K (1995) Biochemical comparison of imipenem, meropenem and biapenem: Permeability, binding to penicillin-binding proteins, and stability to hydrolysis by β-lactamases. *J. Antimicrob. Chemother.* 35(1):75-84