Penicillin G Potassium, USP
PRODUCT DATA SHEET

issue date 01/06/2020

Product Name:	Penicillin G Potassium, USP
Product Number:	P028
CAS Number:	113-98-4
Molecular Formula:	$C_{16}H_{17}KN_2O_4S$
Molecular Weight:	372.49
Form:	Powder
Appearance:	White or almost white crystalline powder
Source:	*Penicillium sp.*
pH:	5.0-7.5
Melting Point:	214-217°C
Storage Conditions:	2-8°C
Description:	Penicillin is a member of the β-lactam antibiotics and was one of the first discovered antibiotics. Penicillin G potassium is sparingly soluble in aqueous solution (0.210 mg/mL). Click here for more forms of penicillin.
Mechanism of Action:	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.
Spectrum:	Penicillin is targets primarily gram positive bacteria including *Staphylococcus* and *Streptococcus* species.

Microbiology Applications

Penicillin is commonly used in clinical *in vitro*microbiological antimicrobial susceptibility tests (panels, discs, and MIC strips) against gram positive microbial isolates. Medical microbiologists use AST results to recommend antibiotic treatment options for infected patients. Representative MIC values include:

- *Streptococcus pneumoniae* 0.004 µg/mL – 0.5 µg/mL
- *Streptococcus agalactiae* 0.03 µg/mL – 0.06 µg/mL
- For a complete list of penicillin MIC values, click here.

Mycoplasma Media Supplements

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

Mycoplasma Agar - *Mycoplasma* Supplement G

Mycoplasma Agar - *Mycoplasma* Supplement P

Plant Biology Applications

In a study by Windsor et al. (1972), penicillin G potassium was shown to control the bacterial plant disease clover club leaf in Crimson Clover plants using 100 µg/mL – 1000 µg/mL.

References:

Guzmán, Flavio, MD. "Beta Lactams Antibiotics (penicillins and Cephalosporins) Mechanism of Action." *Medical Pharmacology*. Pharmacology Corner, 29 Nov. 2008. Web. 21 Aug. 2012.

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