



Ampicillin Trihydrate, USP PRODUCT DATA SHEET

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Product Name:	Ampicillin Trihydrate, USP
Product Number:	A009
CAS Number:	7177-48-2
Molecular Formula:	$C_{16}H_{19}N_3O_4S \cdot 3H_2O$
Molecular Weight:	403.44
Form:	Powder
Appearance:	White crystalline powder
Solubility:	slightly soluble in water (10 mg/mL) and freely soluble in 1 N HCl (50 mg/mL)
Source:	Semi-synthetic
Water Content (Karl Fischer):	12.0%-15.0%
pH:	3.5 - 6.0
Storage Conditions:	$\leq 30^{\circ}C$

Description: Ampicillin Trihydrate, USP is a member of the β -lactam family similar in structure to penicillin.

TOKU-E offers five forms of Ampicillin:

- Ampicillin Trihydrate, USP (A009)
- Ampicillin/Sulbactam (2:1) (A071)
- Ampicillin Anhydrous (A043)
- Ampicillin Sodium (A042)
- Ampicillin Trihydrate, EP (A020)

Ampicillin trihydrate is slightly soluble in water (10 mg/mL) and freely soluble in 1 N HCl (50 mg/mL).

Mechanism of Action: Like all β -lactams, Ampicillin interferes with PBP (penicillin binding protein) activity otherwise involved in the final phase of peptidoglycan synthesis. PBP's are enzymes which catalyze a pentaglycine crosslink between alanine and lysine residues. Without a pentaglycine crosslink, the integrity of the cell wall is severely compromised ultimately leading to cell lysis.

Spectrum: Ampicillin, USP targets Gram-negative non-ESBL (Extended Spectrum β -lactamase) bacteria including *Staphylococcus* and *Streptococcus* species and medically important enteric pathogens such as *Shigella* and *Salmonella*. Interestingly, ampicillin has been found to be effective against certain β -lactam sensitive VRE or vancomycin resistant *Enterococcus*; a glycopeptide antibiotic resistant "superbug." Resistance to Ampicillin is routinely utilized as a selectable marker to confirm successful cell transformation.

Microbiology Applications Ampicillin Trihydrate is often used to select for cells that have been transformed with a plasmid containing the ampR gene which confers resistance to Ampicillin.

Media Supplements

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

Aeromonas Medium Base - Ampicillin Selective Supplement

References:

Pitout JD, Sanders CC, Sanders WE (1997) Antimicrobial resistance with focus on beta-lactam resistance in gram-negative bacilli. *Am. J. Med* 103(1):51-59 PMID 9236486

Waxman DJ and Strominger JL (1983) Penicillin-binding proteins and the mechanism of action of beta-lactam antibiotics. *Ann. Rev. Biochem* 52:825-869 PMID 6351730

Yang W, Zhang L, Lu Z, Tao W, Zhai Z (2001) A new method for protein coexpression in *Escherichia coli* using two incompatible plasmids. *Protein. Expr. Purif.* 22(3):472-478 PMID 11483011

If you need any help, contact us: info@toku-e.com. Find more information on: www.toku-e.com/