

Product Name:	Ampicillin Anhydrous
Product Number:	A043
CAS Number:	69-53-4
Molecular Formula:	$C_{16}H_{19}N_3O_4S$
Molecular Weight:	349.40
Form:	Powder
Appearance:	White crystalline powder
Solubility:	sparingly soluble in water and freely soluble in 1 N NH_4OH (50 mg/mL).
Source:	Semi-synthetic
Water Content (Karl Fischer):	$\leq 1.0\%$
pH:	3.5 - 5.5
Optical Rotation:	$+280^\circ$ to $+305^\circ$
Storage Conditions:	2-8°C

Description: Ampicillin Anhydrous is a member of the β -lactam family and is similar in structure to penicillin.

TOKU-E offers five forms of Ampicillin:

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

Ampicillin Anhydrous is the most stable and pure form that TOKU-E offers. It is sparingly soluble in water and freely soluble in 1 N NH_4OH (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. PBPs 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 targets Gram-negative, non ESBL (Extended Spectrum β -lactamase) bacteria including *Staphylococcus* and *Streptococcus* 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."

Microbiology Applications Ampicillin Anhydrous is often used to select for cells that have been transformed with a plasmid containing the ampR gene which confers resistance to Ampicillin. Ampicillin is typically used at a concentration of 50-100 µg/mL.

Media Supplements

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

Aeromonas Medium Base - Ampicillin Selective Supplement

Technical Data:

FORMULA (g/L)

Tryptone 20.00

Sodium Chloride 0.50

Yeast Extract 5.00

Magnesium Chloride 0.96

Potassium Chloride 0.186

Final pH 7.0 ± 0.2 at 25°C

PREPARATION

Suspend 26.6 grams of the medium in 1L of distilled water. Mix well and dissolve by heating with frequent agitation. Boil for 1 minute until complete dissolution. Dispense into appropriate containers and sterilize at 121°C for 15 minutes. The prepared medium should be stored at 2-8°C. The color of the prepared medium is amber, slightly opalescent.

The dehydrated medium should be homogeneous, free-flowing and beige in color. If there are any physical changes, discard the medium.

USES

SOB MEDIUM is a nutrient rich medium for the preparation and transformation of competent cells. The transformation requires perforation of the bacteria to allow the introduction of alien DNA. In order to survive this process

the competent cells need an isotonic rich medium.

Peptone provides nitrogen, vitamins, minerals and amino acids essential for growth. Yeast extract is source of vitamins, particularly the B-group. Sodium Chloride and Potassium Chloride supplies essential electrolytes for transport and osmotic

balance. Magnesium Sulfate is a source of magnesium ions.

Inoculate with the transformed cells and incubate at 35 ± 2°C for 18 - 24 hours.

MICROBIOLOGICAL TEST

The following results were obtained in the performance of the medium from cell cultures after incubation at 35 °C ± 2°C after 18 - 24 hours

Microorganism Growth

- Escherichia coli ATCC 23724 Good
- Escherichia coli ATCC 53868 Good
- Escherichia coli ATCC 33694 Good
- Escherichia coli ATCC 33849 Good

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/