

<b>Product Name:</b>	Cephalexin Hydrate
<b>Product Number:</b>	C024
<b>CAS Number:</b>	23325-78-2
<b>Molecular Formula:</b>	$C_{16}H_{17}N_3O_4S \cdot H_2O$
<b>Molecular Weight:</b>	347.39 g/mol (anhydrous basis) 365.41 g/mol (monohydrate)
<b>Form:</b>	Powder
<b>Appearance:</b>	White or almost white crystalline powder
<b>Solubility:</b>	slightly soluble in aqueous solution
<b>Source:</b>	Semi-synthetic
<b>Water Content (Karl Fischer):</b>	4.0-8.0%
<b>pH:</b>	3.0-5.5
<b>Optical Rotation:</b>	+149° to +158°
<b>Storage Conditions:</b>	-20°C (protect from light)
<b>Description:</b>	Cephalexin Hydrate is a broad-spectrum, first-generation cephalosporin that interferes with bacterial peptidoglycan synthesis. It is slightly soluble in aqueous solution.
<b>Mechanism of Action:</b>	Like $\beta$ -lactams, cephalosporins 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 cephalosporins is commonly due to cells containing plasmid encoded $\beta$ -lactamases.
<b>Spectrum:</b>	Cephalexin hydrate is a broad-spectrum antibiotic targeting a wide variety of Gram-positive and Gram-negative bacteria especially those which cause respiratory infections.

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

- *Streptococcus pyogenes* 0.2 µg/mL – 12.5 µg/mL
- *Streptococcus pneumoniae* 0.78 µg/mL – 3.12 µg/mL
- For a complete list of Cephalexin MIC values, [click here](#).

*In vitro* degradation of Cephalexin monohydrate and its effect on MIC and MBC was studied using the broth microdilution method. Cephalexin was among the most degraded compounds tested, which has implications for determination of MIC for slow-growing bacteria (Lallemand et al, 2016).

## References:

Georgopapadakou NH (1992) Mechanisms of action of cephalosporin 3'-quinolone esters, carbamates, and tertiary amines in *Escherichia coli*. *Antimicrob. Agents Chemother.* 37(3):559-565

Lallemand EA et al (2016) *In vitro* degradation of antimicrobials during use of broth microdilution method can increase the measured minimal inhibitory and minimal bactericidal concentrations. *Front Microbiol.* 7:2051 PMID 28066372

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