

Product Name:	Ceftazidime Pentahydrate
Product Number:	C059
CAS Number:	78439-06-2
Molecular Formula:	$C_{22}H_{22}N_6O_7S_2 \cdot 5H_2O$
Molecular Weight:	636.65
Form:	Powder
Appearance:	White or almost white crystalline powder
Solubility:	: sparingly soluble in aqueous solution (0.396 mg/mL). Organic solvents can facilitate dissolution.
Source:	Synthetic
pH:	3.0-4.0
Storage Conditions:	-20°C
Description:	Ceftazidime Pentahydrate is a broad-spectrum, third-generation, β -lactam cephalosporin that interferes with bacterial cell wall synthesis. Patented in 1979 by Glaxo Group, Ceftazidime came into commercial use in 1984. It is sparingly soluble in aqueous solution.
Mechanism of Action:	Like β -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 β -lactamases, however, Ceftazidime is stable in the presence of β -lactamases.
Spectrum:	Ceftazidime Pentahydrate is broad-spectrum, targeting both Gram-negative and Gram-positive bacteria, but is most effective for Gram-negative strains including <i>Pseudomonas aeruginosa</i> and <i>Enterobacteriaceae</i> (including β -lactamase positive strains). It is also used for against <i>Streptococcus pneumoniae</i> , and <i>S. pyogenes</i> .

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

- *Pseudomonas aeruginosa* 1 µg/mL – 64 µg/mL
- *Escherichia coli* 0.06 µg/mL – >32 µg/mL
- For a complete list of Ceftazidime MIC values, [click here](#).

Media Supplements

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

PALCAM Agar - PALCAM Selective Supplement

Chromogenic *Listeria* Agar - Chromogenic *Listeria* Selective Supplement

Chromogenic *Listeria* Agar - Chromogenic *Listeria* Differential Supplement

References:

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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 PMID 8384817

Hobi R et al (2001) Anti-HIV-1 activity *in vitro* of Ceftazidime degradation products. Antivir. Chem. and Chemother. 12(2):109-118

Hsu Y et al (2014) Biodegradable drug-eluting nanofiber-enveloped implants for sustained release of high bactericidal concentrations of vancomycin and ceftazidime: *In vitro* and *in vivo* studies. Int. J. Nanomed. 9:4347-4355

Randell SH, Walstad DL, Schwab UE, Grubb BR and Yankaskas JR (2001) Isolation and culture of airway epithelial cells from chronically infected human lungs. In Vitro Cell. Dev. Biol.-Animal 37: 480

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