Cefoperazone sodium
PRODUCT DATA SHEET

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Product Name:	Cefoperazone sodium
Product Number:	C010
CAS Number:	62893-20-3
Molecular Formula:	$C_{25}H_{26}N_9NaO_8S_2$
Molecular Weight:	667.65
Form:	Powder
Appearance:	White or slightly yellow powder.
Solubility:	freely soluble in aqueous solution (50 mg/mL).
Source:	Synthetic
Water Content (Karl Fischer):	≤5%
pH:	4.5-6.5
Storage Conditions:	-20°C
Description:	Cefoperazone sodium is a third generation cephalosporin antibiotic. It is semi-synthetic, β-lactamase resistant, with broad-spectrum bactericidal activity. It is used to study drug-protein binding such as penicillin binding proteins. Cefoperazone A is the principal metabolite. Cefoperazone sodium is freely soluble in aqueous solution (50 mg/mL).
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. Cefoperazone however, is largely resistant to β-lactamases produced by resistant cells.
Spectrum:	Cefoperazone is active against Gram-positive and Gram-negative bacteria (ie *Pseudomonas aeruginosa*).

Microbiology Applications Cefoperazone 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* 0.5 µg/mL – 64 µg/mL
- *Haemophilus influenzae* 0.06 µg/mL – 2 µg/mL
- For a complete list of cefoperazone MIC values, click here.

Media Supplements

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

Campylobacter Blood-Free Selective Agar - CCDA Selective Supplement

Campylobacter Agar - *Campylobacter* Selective Supplement (Karmali)

Blood Free *Campylobacter* Agar - CDMN Selective Supplement

Bolton Broth - Bolton Broth Selective Supplement

Campylobacter Agar Base - Modified Karmali Selective Supplement

Bolton Broth - Modified Bolton Broth Selective Supplement

References:

Brogden RN et al (1981) Cefoperazone: A review of its *in vitro* antimicrobial activity, pharmacological properties and therapeutic efficacy. Drugs 22:423-460 PMD 6459224

Georgopapadakou, N. H. Mechanisms of Action of Cephalosporin 3'-quinolone Esters, Carbamates, and Tertiary Amines in Escherichia Coli. Antimicrobial Agents and Chemotherapy. 37(3) 559-565

Hinkle AM, LeBlanc BM, Bodey GP (1980) *In vitro* evaluation of cefoperazone. Antimicrobial Agents Chemother. 17(3):423-427 PMID 6448578

Matsubara N, Minami S, Muraoka T, Saikawa I, Mitsuhashi S (1979) *In vitro* antibacterial activity of cefoperazone (T-1551), a new semisynthetic cephalosporin. Antimicrob Agents Chemother. 16(6):731-5 PMID 316988