

Product Name:	Ceftiofur Sodium
Product Number:	C061
CAS Number:	104010-37-9
Molecular Formula:	$C_{19}H_{16}N_5NaO_7S_3$
Molecular Weight:	545.54 g/mol
Form:	Powder
Appearance:	White to grey-yellow powder
Solubility:	freely soluble in aqueous solution.
Source:	Synthetic
Water Content (Karl Fischer):	$\leq 3.0\%$
pH:	5.5- 7.5
Storage Conditions:	$-20^{\circ}C$
Description:	<p>Ceftiofur Sodium is the sodium salt of Ceftiofur, a broad-spectrum, third-generation β-lactamase resistant cephalosporin commonly used in veterinary research applications. It was first described in 1987. Its metabolite (desfurolyceftiofur) also has antibiotic activity. Ceftiofur Sodium is freely soluble in aqueous solution.</p> <p>We also offer: Ceftiofur hydrochloride (<u>C228</u>)</p>
Mechanism of Action:	<p>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. Like many cephalosporins, Ceftiofur is resistant to β-lactamases.</p>
Spectrum:	<p>Ceftiofur is a broad-spectrum antibiotic targeting a wide variety of Gram-positive and Gram-negative bacteria including the β-lactamase producing strains.</p>

Microbiology Applications Ceftiofur Sodium 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. Representative effective ranges include:

- *Salmonella spp.* 0.5 µg/mL – 2 µg/mL
- *Escherichia coli* 0.12 µg/mL – 0.5 µg/mL
- For a representative list of Ceftiofur MIC values, [click here](#).

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 PMID 8384817

Holyoak GR, Wang S, Liu S, Bunch TJ, Evans RC and Bunch TD (2009) The effects of ceftiofur sodium (axcel) on bovine oocyte and preimplantation embryonic development assessed by *in vitro* embryo production techniques. *J. Vet. Pharmacol. Ther.* 21(2):92-98 PMID 9597645

Parker RA, Clegg PD and Taylor SE (2011) The *in vitro* effects of antibiotics on cell viability and gene expression of equine bone marrow-derived mesenchymal stromal cells. *Equine Vet. J.* 44(3):355-360

Salmon SA, Watts JL, Yancey RJ (1996) *In vitro* activity of Ceftiofur and its primary metabolite, desfuroylceftiofur, against organisms of veterinary importance. *J Vet Diagn Invest.* 8(3):332-6. PMID 8844576

Yancey RJ et al (1987) Ceftiofur sodium, a broad-spectrum Cephalosporin: Evaluation *in vitro* and *in vivo* in mice. *Am. J. Vet. Res.* 48(7): 1050-1053 PMID 3631686