

Product Information

Nitrofurantoin

Product Number **N 7878**
Store at Room Temperature

Product Description

Molecular Formula: C₈H₆N₄O₅
Molecular Weight: 238.2
CAS Number: 67-20-9
Melting Point: 270-272 °C (with decomposition)¹
 λ_{max} : 370 nm (H₂O)¹
Extinction Coefficient: E^{1%} = 776 (H₂O)¹
Synonyms: N-(5-nitro-2-furfurylidene)-1-aminohydantoin, nitrofurantoin, 1-[[[(5-nitro-2-furanyl)methylene]amino]-2,4-imidazolidinedione]¹

Nitrofurantoin is an antibactericidal compound that has been historically prepared by the reaction of 1-aminohydantoin sulfate and 5-nitro-2-furaldehyde diacetate.¹ It shows activity against many Gram-positive and Gram-negative bacteria. Nitrofurantoin is effective against enterococci, staphylococci, streptococci, corneobacteria, many strains of *Escherichia coli*. By contrast, most strains of *Proteus* spp. and *Pseudomonas aeruginosa* are more resistant to this compound.² Other microbial species whose susceptibility to nitrofurantoin has been studied include *Plesiomonas shigelloides*, *Campylobacter*, and *Providencia*.^{3,4,5}

The susceptibility of primary rat lung cells in culture to nitrofurantoin has been investigated.⁶ A report has described the use of antioxidants to mitigate the toxic effects of nitrofurantoin on human WI-38 fibroblasts in culture.⁷ Alterations to the *in vitro* morphologic features, viability, and phagocytic activity of isolated bovine mammary polymorphonuclear leukocytes caused by various antibiotics, including nitrofurantoin, have been reported.⁸

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in dimethylformamide (DMF, 50 mg/ml), with heat as needed, yielding a clear, yellow/green solution. It is also soluble in water (0.19 mg/ml), ethanol (0.51 mg/ml), acetone (5.1 mg/ml), glycerol (0.6 mg/ml), and polyethylene glycol (15 mg/ml).¹

References

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3. Stock, I., and Wiedemann, B., Natural antimicrobial susceptibilities of *Plesiomonas shigelloides* strains. *J. Antimicrob. Chemother.*, **48(6)**, 803-811 (2001).
4. Gebhart, C. J., et al., *In vitro* activities of 47 antimicrobial agents against three *Campylobacter* spp. from pigs. *Antimicrob. Agents Chemother.*, **27(1)**, 55-59 (1985).
5. Kadavy, D. R., et al., Natural antibiotic resistance of bacteria isolated from larvae of the oil fly, *Helaeomyia petrolei*. *Appl. Environ. Microbiol.*, **66(11)**, 4615-4619 (2000).
6. Bundschuh, D. S., et al., Isolation and characterization of rat primary lung cells. *In Vitro Cell Dev. Biol. Anim.*, **31(9)**, 684-691 (1995).
7. Michiels, C., and Remacle, J., Quantitative study of natural antioxidant systems for cellular nitrofurantoin toxicity. *Biochim. Biophys. Acta*, **967(3)**, 341-347 (1988).
8. Nickerson, S. C., et al., Effect of antibiotics and vehicles on bovine mammary polymorphonuclear leukocyte morphologic features, viability, and phagocytic activity *in vitro*. *Am. J. Vet. Res.*, **46(11)**, 2259-2265 (1985).

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