

Product Name:	Trimethoprim Lactate
Product Number:	T012
CAS Number:	23256-42-0
Molecular Formula:	$C_{14}H_{18}N_4O_3 \cdot C_3H_6O_3$
Molecular Weight:	380.40 g/mol
Form:	Powder
Appearance:	White or off-white powder
Storage Conditions:	2-8 °C
Description:	<p>Trimethoprim lactate is a synthetic derivative of trimethoxybenzyl-pyrimidine with bacteriostatic and antiprotozoal properties. As a pyrimidine inhibitor of bacterial dihydrofolate reductase, trimethoprim binds tightly to the bacterial enzyme, blocking the production of tetrahydrofolic acid from dihydrofolic acid, arresting folic acid synthesis.</p> <p>When Trimethoprim lactate is combined with sulfonamides (like <u>sulfamethoxazole (S045)</u>) the two compounds show bactericidal effects, but are only bacteriostatic when used separately. The activity is attributed to their synergistic effect in inhibiting folic acid metabolism in bacteria.</p> <p>Trimethoprim lactate has a wide antibacterial spectrum and is active against most gram-positive and gram-negative aerobic bacteria, including <i>Nocardia</i>, <i>Brucella</i>, Gram-negative bacilli, and some Gram-positive bacteria like <i>Streptococcus</i>, <i>Toxoplasma</i> and some other coccidians. It is used to treat recurrent cystitis, mild acute prostatitis, urinary tract infections, asymptomatic bacteriuria during pregnancy and respiratory tract infections.</p> <p>TOKU-E offers two forms of trimethoprim: <u>trimethoprim (T011)</u> and trimethoprim lactate (T012). Trimethoprim is slightly soluble in aqueous solution (12.1 mg/mL). Trimethoprim lactate is freely soluble in aqueous solution (19.6 mg/mL).</p>
Mechanism of Action:	<p>Trimethoprim lactate acts by interfering with the action of bacterial dihydrofolate reductase, inhibiting synthesis of tetrahydrofolic acid. Tetrahydrofolic acid is an essential precursor in the de novo synthesis of the intermediate Thymidine monophosphate (dTMP), precursor of DNA metabolite Thymidine triphosphate.</p>
Spectrum:	<p>Trimethoprim lactate has a wide antibacterial spectrum and is active against most gram-positive and gram-negative aerobic bacteria, including <i>Nocardia</i>, <i>Brucella</i>, Gram-negative bacilli, and some Gram-positive bacteria like <i>Streptococcus</i>, <i>Toxoplasma</i> and some other coccidians. It is used to treat recurrent cystitis, mild acute prostatitis, urinary tract infections, asymptomatic bacteriuria during pregnancy and respiratory tract infections.</p>

Microbiology Applications Trimethoprim lactate 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:

- *Escherichia coli* 0.25 µg/mL - 64 µg/mL
- *Haemophilus influenzae* 0.15 µg/mL - 16 µg/mL
- For a complete list of trimethoprim MIC values, [click here](#).

Plant Biology Applications

Trimethoprim lactate can be used in combination with rifampicin to provide sufficient coverage against pathogenic microbes. When used without other supplemental antibiotics, trimethoprim was not shown to provide sufficient coverage (Pollock et al.1983).

References:

Weir, D. G., and J. Scott. "Mechanism of the Antimicrobial Drug Trimethoprim Revisited." *PubMed* (2000): 2519-524. www.ncbi.gov. 14 Dec. 2000. Web. 21 Aug. 2012.

Kneifel W. and Leonhardt W., Testing of different antibiotics against Gram-positive and Gram-negative bacteria isolated from plant tissue culture. *Plant Cell, Tissue and Organ Culture*, Vol. 29, pp. 139-144, 1992.

Pollock K., Barfield D.G. and Shields R., The toxicity of antibiotics to plant cell cultures. *Plant cell reports*, Vol. 2, pp. 36-39, 1983.

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