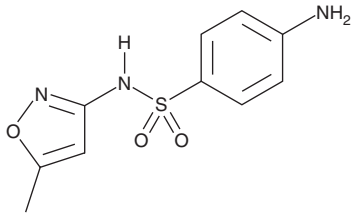
# PRODUCT INFORMATION

## Sulfamethoxazole

*Item No. 23613*

**CAS Registry No.:** 723-46-6
**Formal Name:** 4-amino-N-(5-methyl-3-isoxazolyl)-benzenesulfonamide
**Synonyms:** NSC 147832, Ro 4-2130
**MF:** $C_{10}H_{11}N_3O_3S$
**FW:** 253.3
**Purity:** ≥98%
**UV/Vis.:** $\lambda_{max}$: 271 nm
**Supplied as:** A crystalline solid
**Storage:** -20°C
**Stability:** ≥4 years




*Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.*

### Laboratory Procedures

Sulfamethoxazole is supplied as a crystalline solid. A stock solution may be made by dissolving the sulfamethoxazole in the solvent of choice, which should be purged with an inert gas. Sulfamethoxazole is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of sulfamethoxazole in ethanol is approximately 0.25 mg/ml and approximately 50 mg/ml in DMSO and DMF.

Sulfamethoxazole is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, sulfamethoxazole should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. Sulfamethoxazole has a solubility of approximately 0.5 mg/ml in a 1:2 solution of DMSO:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

### Description

Sulfamethoxazole is a sulfonamide antibiotic.[1] It inhibits growth of *E. coli* (MIC = 10 µg/ml) and clinical isolates of methicillin-resistant *S. aureus* (MRSA; MICs = 25-50 µg/ml).[2,3] Sulfamethoxazole, in combination with trimethoprim (Item No. 16473) at a ratio of 20:1, inhibits growth of MRSA *in vivo* in mice (MIC = 0.8 µg/ml; $ED_{50}$s = 6.4 and 9.6 mg/kg for two MRSA strains).[3] In a mouse model of urinary tract infection with *E. coli*, a combination of sulfamethoxazole and trimethoprim decreases recurrent infection when administered for 10 days.[4] Sulfamethoxazole acts by inhibiting dihydropteroate synthase (DHPS), which converts a pteridine and 4-aminobenzoic acid (PABA; Item No. 18659) to dihydropteroate, an intermediate in folate biosynthesis. It inhibits recombinant *P. carinii* DHPS ($IC_{50}$ = 23 nM; $K_i$ = 7.5 nM) and folate biosynthesis *in situ* by 48.6%. Formulations containing sulfamethoxazole and trimethoprim have been used to treat bronchitis, prostatitis, and urinary tract infections among other infectious conditions.

### References


1. Hong, Y.-L., Hossler, P.A., Calhoun, D.H., *et al.* Inhibition of recombinant *Pneumocystis carinii* dihydropteroate synthetase by sulfa drugs. *Antimicrob. Agents Chemother.* **39(8)**, 1756-1763 (1995).
2. Greenwood, D. and O'Grady, F. Activity and interaction of trimethoprim and sulphamethoxazole against *Escherichia coli*. *J. Clin. Pathol.* **29(2)**, 162-166 (1976).
3. Elwell, L.P., Wilson, H.R., Knick, V.B., *et al.* In vitro and in vivo efficacy of the combination trimethoprim-sulfamethoxazole against clinical isolates of methicillin-resistant *Staphylococcus aureus*. *Antimicrob. Agents Chemother.* **29(6)**, 1092-1094 (1986).
4. Schilling, J.D., Lorenz, R.G., and Hultgren, S.J. Effect of trimethoprim-sulfamethoxazole on recurrent bacteriuria and bacterial persistence in mice infected with uropathogenic *Escherichia coli*. *Infect. Immun.* **70(12)**, 7042-7049 (2002).





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