D-Cycloserine
PRODUCT DATA SHEET

issue date 01/06/2020

Product Name:	D-Cycloserine
Product Number:	C041
CAS Number:	68-41-7
Molecular Formula:	$C_3H_6N_2O_2$
Molecular Weight:	102.09
Form:	powder
Appearance:	white to pale white crystalline powder
Solubility:	soluble in aqueous solution
Source:	synthetic
pH:	5.5-6.5
Optical Rotation:	+108° to +114°
Storage Conditions:	-20°C
Description:	D-Cycloserine is an amino acid analog antibiotic. D-cycloserine acts as a competitive inhibitor of D-alanine, an essential amino acid during peptidoglycan synthesis. It is a broad-spectrum antibiotic that can be used as a selective agent in several types of isolation media. D-cycloserine is soluble in aqueous solution.
Mechanism of Action:	D-Cycloserine inhibits cell wall biosynthesis, specifically the D-Ala peptide bond formation. It competitively inhibits alanine racemase (which produces D-alanine) and D-alanine ligase, which joins the terminal 2 amino acid residues together. D-cycloserine is a ligand for the N-methyl-D-aspartate (NMDA) glycine receptor and has partial agonist characteristics, and has proven to have pharmacological activity in enhancing extinction memory.
Spectrum:	D-Cycloserine is a broad-spectrum antibiotic that can be used against the causal agent of tuberculosis (*Mycobacterium tuberculosis*).
Microbiology Applications	D-Cycloserine can be used as a selective agent in several types of isolation media: *Perfringens* Agar - SFP and TSC selective supplements *Clostridium difficile* agar - Isolation of *Clostridium difficile* m-CP Medium - Membrane *C. perfringens* Selective Supplement

References:

Hood WF, Compton RP, and Monahan JB (1989) D-Cycloserine: A ligand for the N-methyl-D-aspartate coupled glycine receptor has partial agonist characteristics. Neurosci Lett 98(1):91-95 PMID 2540460

Lambert MP and Neuhaus FC (1972) Mechanism of D-Cycloserine action: Alanine racemase from *Escherichia col*i. J. Bacteriol. 110(3):978-987 PMID 4555420

Peters J and De Vries TJ (2013) D-Cycloserine administered directly to infralimbic medial prefrontal cortex enhances extinction memory in sucrose-seeking animals. Neurosci. 230:24-30 PMID 23159319