

L-Canavanine (Sigma Aldrich C1625)

Synonyms: Canavalia ensiformis; O-Guanidino-L-homoserine, L- α -Amino- γ -(guanidinooxy)-n-butyric acid

CAS-No: 543-38-4

Appearance: White odorless crystalline powder. Soluble.

Storage: 2-8°C, keep container tightly closed in a cool, dry and well-ventilated place.

Molecular Formula: C₅H₁₂N₄O₃

Molecular Weight: 176.17

Description: L-Canavanine is a naturally occurring L-aminoacid. It is an analog of arginine and interferes with L-arginine-utilizing enzymes due to its structural similarity. L-Canavanine is a selective inhibitor of nitric oxide synthase (NOS2, iNOS).

Main Use: Selection/counterselection drug.

L-canavanine is imported into the cell via and argenine/histidine permease, encoded by the can1 locus. Mutation at the can1 locus results in high-level resistance to L-Canavanine.

Because canavanine is a competitive inhibitor, arginine must be excluded from media used for testing sensitivity to the drug. Canavanine resistance must also be scored under high-nitrogen conditions, such as those provided by SD or SC medium, since the CAN1 permease will then provide the only entry route to the cell for arginine and canavanine. In the presence of low-nitrogen conditions, effectively those provided by YPD medium, the general amino acid permease (GAP) system is induced and arginine and canavanine can also be taken up by this route.

Hazards identification

Danger! Harmful by inhalation, in contact with skin and if swallowed

Potential Health Effects

Inhalation: Harmful if inhaled. May cause respiratory tract irritation.

Ingestion: Harmful if swallowed.

Skin: Harmful if absorbed through skin. May cause skin irritation.

Eyes: May cause eye irritation.

First aid measures

General advice: Consult a physician.

Eyes: Flush eyes with water

Skin: Wash off with soap and plenty of water. Consult a physician.

Ingestion: Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

Inhalation: If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

Most important symptoms and effects, both acute and delayed:

Anemia. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Emergency phone: Giftinformationscentralen 112

Fire Fighting Measures

Extinguishing Media: Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Special hazards arising from the substance or mixture

Carbon oxides, nitrogen oxides (NO_x)

Advice for firefighters

Wear self-contained breathing apparatus for fire fighting if necessary

Handling and storage

Storage: Store in cool place (2-8°C). Keep container tightly closed in a dry and well-ventilated place.

Precautionary safety measurements upon handling:

Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed.

Respiratory Protection: For nuisance exposures use type P1 (EN 143) particle respirator. For higher-level protection use type ABEK-P2 EN143 respirator cartridges.

Eye/face protection: Safety glasses with side-shields.

Skin Protection: Handle with gloves. Wash and dry hands.

Disposal considerations

Waste treatment methods

Product: Offer surplus and non-recyclable solutions to a licensed disposal company. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging: Dispose of as unused product.

Stability and Reactivity

Incompatibilities with Other Materials: Strong oxidizing agents

ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

Environmental precautions

Do not let product enter drains.

Methods and materials for containment and cleaning up

Pick up and arrange disposal without creating dust. Sweep up and shovel. Keep in suitable, closed containers for disposal.