L-Cysteine hydrochloride monohydrate

(From non-animal source)
Cell Culture tested

Product Code: TC058

Product Description :

Molecular Weight: 175.64
Molecular Formula: $C_3H_7NO_2S \cdot HCl \cdot H_2O$
CAS No: 7048-04-6

It is a non-essential α-amino acid, chemically polar in nature, coded by codons UGU and UGC. It is one of the two sulfur containing amino acids. Because of presence of thiol group (-SH) it is less toxic and acts as an anti-oxidant to prevent free radical generation.

It is used as a major component in wide range of cell culture media including classical and serum-free media. It plays many roles in cell culture systems. Some of them are mentioned below:

1. **Substrate for protein synthesis**:
Thiol group present in the structure of cysteine play important role in formation of disulfide linkages. It is also responsible for protein folding and generation of secondary and tertiary structures of protein. Cystine, the oxidation product participates in numerous posttranslational modifications.

2. **Synthesis of enzyme acetyl CoA.**

3. **Protection of cells from oxidative stress:**
L-cysteine participates as a rate limiting enzyme in synthesis of glutathione. Glutathione catalyses conversion of dehydroascorbic acid to ascorbis acid, which ultimately serves as an effective anti-oxidant and prevents lipid peroxidation. L-cysteine is metabolized by many cells to produce hypotaurine and taurine. These two molecules help detoxify the culture media by reacting with free hydroxyl groups and hypochlorous acid generated the media.

4. **Source of sulfur**:
L-cysteine acts as a major source of sulfur in cell culture.

5. **Reservoir for cysteine derivatives:**
Oxidation of thiol group of cysteine leads to formation of cystine. Unpaired protein cysteine sulfhydryls can react with a free cysteine sulfhydryls to form mixed disulfides. These disulfides act as a storage and transport reservoir for cysteine equivalents.

6. **Metal ion carrier:**
Thiol group in cysteine has affinity for metal ions such as iron, zinc, nickel, copper etc. This property makes it useful in transport of metal-ion linked molecules (such as cytochrome) across the cell membrane.

Directions :

L-Cysteine hydrochloride monohydrate is soluble in water.

Quality Control:

Appearance
White crystals or crystalline powder.

Solubility
Clear colorless solution at 10gm in 100ml of water .

pH of 1% solution in water
1.50 -2.00

Specific rotation [alpha]20/D
+6.1° to +7.8°

Chloride (Cl)
19.89 to 20.29%

Ammonium (NH4)
<= 0.02%

Sulphate (SO4)
<= 0.02%

Iron (Fe)
<= 0.001%

Heavy metals (Pb)
<= 0.001%

Arsenic (As)
<= 0.0001%

Residue on ignition
<= 0.1%

Loss on drying
8.5 to 12.0%

Other amino acids
Conforms

Please refer disclaimer overleaf

Assay
NLT 98.5%

Cell Culture Test
Passes

Storage and Shelf Life:

Store at 10-30ºC away from bright light
Shelf life is 36 months
Use before expiry date given on the product label.
Aqueous solutions L-Cysteine hydrochloride monohydrate get oxidized to cystine when exposed to air. Presence of heavy metals (such as copper and iron) accelerate the oxidation process. Neutral or alkaline pH also contributes to oxidation. Solutions are relatively stable at acidic pH.

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