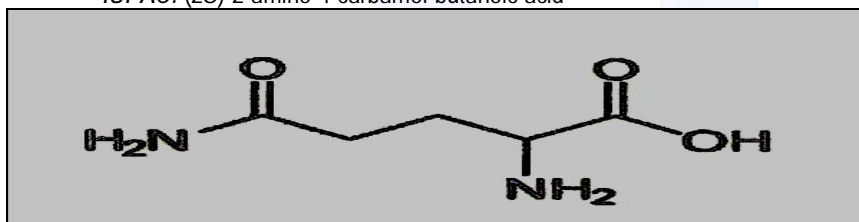




### Product Profile

IUPAC: (2S)-2-amino-4-carbamol-butanoic acid



Product Name:	L-Glutamine ,29.2 mg/m l in 0.85% NaCl
Product Catalog Number	03-020-1
Concentration:	200mM
Unit Size Availability:	(A)500ml;(B)100ml;(C)20ml
Formulation:	Frozen Solution
Optimal Storage Conditions:	-20°C
Stability: (Under Defined Handling & Storage)	Please Refer To The Product Label

**Important Note!** Please read the *MSDS* and *Product Profile* carefully in their entirety *before* using this material for possible safety precautions and potential hazards.

#### *Product Description*

L-Glutamine, a precursor of Glutamate, is one of the most readily available sources of energy for many rapidly dividing cell-types for use *in vitro*. This Amino Acid is formed from Glutamic Acid by the action of glutamine synthetase. It is a clear, colorless solution at 37°C and is a key component and essential amino acid that is required in many cell-culture media formulations and in virtually all mammalian cells in culture.

Glutamine is one of the twenty (20) Amino Acids commonly found and directly coded for in proteins. It is the amide at the  $\gamma$ -carboxyl of the Amino Acid Glutamate. Glutamine can participate in covalent cross-linking reactions between proteins, by forming peptide-like bonds by a transamidation reaction with lysine residues. This reaction, catalyzed by clotting factor XIII stabilizes the aggregates of fibrin formed during blood clotting. This cross-linking reaction is catalyzed by a transamidase enzyme. Media for animal cell culture contain some 10X more Glutamine than other Amino Acids, the excess presumably acting as a carbon source. Glutamine and Proline are synthesized from Glutamic Acid.

Amino acids are the building blocks (i.e. linear chains of amino acids) of proteins and proteins have a variety of functions in metabolism, may be precursors for the biosynthesis of other biological molecules, function with coenzymes, are critical to life and are therefore needed by every living organism. An amino acid is a molecule containing both amine and carboxyl functional groups. Proteins are chains of amino acids linked together by peptide bonds. Chemically speaking, they are carboxylic acids which have an amine group attached to it. Next to water, protein makes up the largest portion of our body weight as it is contained in all the muscles, body organs, hair, nails and other body systems. There are more than 500 amino acids which occur in nature of which humans can produce 10 of 20 amino acids; the others must be supplied by the diet. Unlike fat and complex carbohydrates, the human body does not store excess amino acids as a reserve; they must be supplied in the diet every day.

L-Glutamine is also suitable for molecular biology applications. Most commercially available media are formulated with L-glutamine which is either included in the basal formula or added as a supplement to the liquid formulations at time of use. **Always use** aseptic technique when handling or supplementing media after filtration.

A significant portion of the energy required to maintain cell growth of the energy produced can vary with cell type and comes from the oxidation of L-Glutamine. Typical ranges for L-Glutamine in formulations are 1-4mM which is about 10 times the concentration of other Amino Acids. This is a consequence of the importance of L-Glutamine not only as an energy source but also its role in protein synthesis. The high concentrations of L-Glutamine present in formulations may also be due to its somewhat unstable nature in solution. However, dipeptide forms are available which are not only more stable in solution but also autoclavable without untoward decomposition.

#### *Predominant Characteristics of L-Glutamine include:*

- § Non-Animal Source
- § Meets USP Testing Specifications
- § Cell-Culture & Endotoxin Tested
- § Suitable for Cell-Culture & Molecular Biology Applications
- § Relatively Long-Storage When Handled and Stored Properly Under Specified Conditions

**Storage & Stability:**

This product should be stored under ideal conditions at -20°C. Do **not** use after the expiration date as specified on the label. L-Glutamine is very stable as a dry powder and as a frozen solution. At physiological pH in liquid media or stock solutions, L-Glutamine is labile (relatively unstable) and degrades rapidly once the product has been opened and refrigerated. The maximum shelf-life is then reduced approximately to two weeks. Do not expose to light for prolonged periods as it is light-sensitive. For prolonged storage, aliquot and re-freeze. Multiple freeze/thaw cycles will cause a loss of product activity. When stored in the dark under ideal conditions, the product is stable until the expiry date.

**Instructions/Procedure:**

- 1) Take a bottle out from proper storage conditions at -20°C and thaw to room temperature.
- 2) Make sure that the cap of the bottle is tight.
- 3) Gently swirl the solution in the bottle.
- 4) Wipe the outside of the bottle with a disinfectant solution such as 70% ethanol.
- 5) Using aseptic/sterile technique under a laminar-flow culture hood, work according to established protocols.

**Quality Control:**

Test	Specification
Cell Culture:	Test & Record
Endotoxin:	Test & Record
pH:	7.0-7.6
Sterility:	Sterile

**Auxiliary Products**

Product Name	Catalog Number	Storage Temperature
Dulbecco's Phosphate Buffered Saline(DPBS) without Calcium and Magnesium	02-023-1	Room Temperature(15-30)
L-Alanyl-L-Glutamine Solution(A Dipeptide Substitute)	03-022-1	-20°C
Penicillin-Streptomycin Solution,10,000 units/ml Penicillin G Sodium Salt,10mg/ml Streptomycin	03-031-1	-20°C
Sterile Culture-Grade Water	03-055-1	Room Temperature(15-30)
Cell Dissociation Solution, Non-Enzymatic	03-071-1	2-8°C
Fetal Bovine Serum	04-001-1	-20°C
Fetal Bovine Serum(Qualified for Human Embryonic Stem Cells)	04-002-1	-20°C
Adult Bovine Serum	04-003-1	-20°C
Serum-Free Cell Freezing Medium	05-065-1	2-8°C
Colchicine Solution, 10µg/ml in DPBS	12-003-1	-20°C
Colcemid Solution, 10µg/ml in DPBS	12-004-1	-20°C
Potassium Chloride(KCl) Solution(0.075M)	12-005-1	2-8°C
Phytohemagglutinin-M(PHA-M), Lyophilized	12-006-1	2-8°C
<b>Note:</b> For a list of other Antibiotics, Serum, Reagents and Supplements, please refer to our Product Catalog, Product Profiles, Product Guides and Internet Site.		

**References:**

- 1) Sullivan Jr. John B. Krieger, Gary R. Hazardous Materials Toxicology: Clinical Principles of Environmental Health. Williams & Wilkins: Baltimore, Maryland, pps.157, 940-945.
- 2) Barile, Frank A. Clinical Toxicology: Principles and Mechanisms. CRC Press: Boca Raton, Florida, 2004.
- 3) Lackie, J. M. The Dictionary of Cell & Molecular Biology, Academic Press: London, 2007
- 4) O'Neil, Maryadele et. al., The Merck Index, 14<sup>th</sup> Edition, Whitehouse Station, New Jersey,2006
- 5) Biological Industries (BI) Specifications
- 6) Current Edition USP/E Ph
- 7) Martindale The Extra Pharmacopeia, 28th Edition, Royal Pharmaceutical Society: London, England
- 8) Freshney, R.I. Animal Cell Culture: A Practical Approach, IRL Press, Oxford, p.25.