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ProductInformation

L-Arginine monohydrochloride
Cell culture tested, not synthetic, meets EP, JP & USP testing specifications

Product Number **A6969**

Product Description

Molecular Formula: $C_6H_{14}N_4O_2 \bullet HCl$
Molecular Weight: 210.7
CAS Number: 1119-34-2
pI: 10.76[1]
pK_a: 1.82 (COOH), 8.99 (α-NH_2), 12.48 (guanido group)[1]
Specific Rotation: 21.9 ° (12 mg/ml, dilute HCl, 21 °C)[2]
Synonyms: (S)-2-amino-5-guanidinopentanoic acid hydrochloride, S(+)-2-amino-5-[(aminoiminomethyl)amino]pentanoic acid hydrochloride, 2-amino-5-guanidinovaleric acid hydrochloride[2]

This product is cell culture tested (0.084 mg/ml) and is tested for endotoxin levels.

L-Arginine is one of the three amino acids with basic side chains, and is very hydrophilic in character. It contains a guanidino group in the side chain, and this moiety is protonated at physiological pH. Arginine is biosynthesized in the kidneys from citrulline, whose precursor is glutamate via the formation of ornithine. In amino acid degradation *in vivo*, arginine is hydrolyzed to urea and ornithine by arginase. Arginine can be metabolized to glutamate, which in turn is converted to α-ketoglutarate for entry into the citric acid cycle.[3,4]

L-Arginine is used in cell culture as a component of MEM amino acids solution (Product No. M 5550). Cells utilize L-arginine as a precursor for the production of nitric oxide (NO), which is an activator of guanylyl cyclase and leads to the production of the second messenger cGMP.[4] The production of NO from cultured porcine aortic endothelial cells has been demonstrated.[5]

Virulence gene expression in a tRNA modification-deficient mutant of *Shigella flexneri* has been modulated by the addition of L-arginine.[6] A study of the effects of L-arginine on cultured human osteoblasts has been reported, with relation to bone metabolism and growth.[7] An investigation of varying the environment for growth of *Escherichia coli* between growth in the presence of excess nitrogen (ammonia) to nitrogen starvation, where L-arginine is used as an alternate nitrogen source, has been reported.[8]

Precautions and Disclaimer

For Laboratory Use Only. Not for drug, household or other uses.

Preparation Instructions

This product is soluble in water (100 mg/ml), yielding a clear, colorless solution.

Storage/Stability

Solutions of L-arginine may be autoclaved. Aqueous solutions of this product are strongly alkaline and tend to absorb carbon dioxide from the atmosphere on standing.[2]

References

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2. The Merck Index, 12th ed., Entry# 817.
3. Biochemistry, 3rd ed., Stryer, L., W. H. Freeman (New York, NY: 1988), pp. 20, 500, 501, 505.
4. Textbook of Biochemistry with Clinical Correlations, 5th ed., Devlin, T. M., ed., Wiley-Liss (New York, NY: 2002), pp. 97, 789, 791, 871.
5. Palmer, R. M., et al., Vascular endothelial cells synthesize nitric oxide from L-arginine. Nature, **333(6174)**, 664-666 (1988).

6. Durand, J. M., and Bjork, G. R., Putrescine or a combination of methionine and arginine restores virulence gene expression in a tRNA modification-deficient mutant of Shigella flexneri: a possible role in adaptation of virulence. Mol. Microbiol., **47(2)**, 519-527 (2003).
7. Torricelli, P., et al., L-arginine and L-lysine stimulation on cultured human osteoblasts. Biomed. Pharmacother., **56(10)**, 492-497 (2002).
8. Atkinson, M. R., et al., Activation of the glnA, glnK, and nac promoters as <I>Escherichia coli</I> undergoes the transition from nitrogen excess growth to nitrogen starvation. J. Bacteriol., **184(19)**, 5358-5363 (2002).

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