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ProductInformation

Adenosine 5'-triphosphate disodium salt
cell culture tested

Product Number **A 6419**
Storage Temperature –0 °C

CAS# 987-65-5
Synonym: ATP

Product Description
Molecular Formula: $C_{10}H_{14}N_5Na_2O_{13}P_3$
Molecular Weight: 551.1 (anhydrous)
pK_a: 4.0 (amino group); 6.5 (secondary phosphate)
λ_{max}: 259 nm
Extinction Coefficient: E^{mM} = 15.4 (259 nm in 100 mM phosphate buffer, pH 7.0).

Adenosine 5'-triphosphate (ATP) and its phosphate bonds are the basic components of energy exchange in many biological systems. The purification and crystallization of ATP from equine muscle led to the entry of the Sigma Chemical Company into the research biochemical field. Sigma became the first to offer stable, crystalline ATP with a purity approaching 100%. The initial products were isolated from muscle tissue and precipitated with ethanol.[1] Currently, this product is isolated from a microbial source and is produced via a fermentation process. No chemical phosphorylation is involved.

This ATP has been tested with cell lines to verify the product is not cytotoxic.

ATP has intrinsic metal binding affinity. The binding constant for various metals are (given as per mole):[2]
Mg^{2+} (9,554), Na^{+} (13), Ca^{2+} (3,722),
K^{+} (8), Sr^{2+} (1,381), Li^{+} (25).

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

Preparation Instructions
ATP is soluble in water (50 mg/ml), yielding a clear, colorless solution. This solution is mildly acidic (pH approximately 3.5).

Storage/Stability
The product is routinely shipped at ambient temperature without degradation. It is recommended to store the product at –0 °C with desiccation. A very slow dismutation occurs in the powdered product with 2 ATP molecules forming ADP and adenosine 5'-tetraphosphate. A decomposition of less than 0.5% per year is observed. The product is stable for at least 2 years.

Aqueous solutions of ATP are stable for months when frozen at –15 °C and for approximately one week at 0 °C. ADP is the first hydrolysis product formed, with additional hydrolysis leading to the formation of AMP. However, ATP solutions are only stable for several hours at 0 ºC when dissolved in a trichloroacetic acid solution. In alkaline solution, it rapidly decomposes to inorganic pyrophosphate and adenosine 5'-phosphate even at 0 °C.[3]

References
1. Berger, L., Biochim. Biophys. Acta, **20**, 23 (1956).
2. Wilson, J.E., et al., Chelation of divalent cations by ATP, studied by titration calorimetry. Anal. Biochem., **193**, 16 (1991).
3. Data for Biochemical Research, 3rd ed., Dawson, R.M.C., et al., Oxford University Press (New York, NY: 1986) p. 78.

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