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ProductInformation

Adenosine 5'-triphosphate dipotassium salt

Product Number **A 8937**
Storage Temperature –0 °C

CAS# 42373-41-1
Synonym: ATP

Product Description
Molecular Formula: $C_{10}H_{14}K_2N_5O_{13}P_3$
Molecular Weight: 583.4 (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 preparation of ATP is not recommended for use as an ATP standard in bioluminescence assays. The recommended ATP products for standards in bioluminescence experiments are sodium salts of ATP: Product No. A 3377 (packaged in bulk, to be weighed by the user) and Product Code FL-AAS, preweighed vials equivalent to 1.0 mg of ATP (2 µmole).

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.

Storage/Stability
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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