

Adenosine 5'-triphosphate disodium salt

Product Number:	A8270
CAS Number :	987-65-5
Synonyms:	ATP; ATP disodium, trihydrate
Storage Temperature:	-20 °C
Molecular Formula:	$C_{10}H_{14}O_{13}N_5P_3Na_2 \cdot 3H_2O$
Molecular Weight:	605.24
Grade:	Ultra Pure

Product Description

Adenosine 5'-triphosphate (ATP) and its phosphate bonds are the basic components of energy exchange in many biological systems. ATP transports chemical energy within cells for metabolism. It is one of the end products of photophosphorylation, cellular respiration, and fermentation and used by enzymes and structural proteins in many cellular processes, including biosynthetic reactions, motility, and cell division. One molecule of ATP contains three phosphate groups, and it is produced by a wide variety of enzymes, including ATP synthase, from adenosine diphosphate (ADP) or adenosine monophosphate (AMP) and various phosphate group donors. Substrate-level phosphorylation, oxidative phosphorylation in cellular respiration, and photophosphorylation in photosynthesis are three major mechanisms of ATP biosynthesis.

ATP was discovered in 1929 by Karl Lohmann, Fiske and Y. Subbarow of Harvard Medical School, but its correct structure was not determined until some years later. It was proposed to be the main energy transfer molecule in the cell by Fritz Albert Lipmann in 1941, that is, being the intermediary molecule between energy-yielding (exergonic) and energy-requiring (endergonic) reactions. It was first artificially synthesized by Alexander Todd in 1948.

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 -20°C with desiccation. A very slow dismutation occurs in the powdered product with 2 ATP molecules forming ADP and adenosine 5'-tetrphosphate. 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 -20 °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 °C when dissolved in a trichloroacetic acid solution. In alkaline solution, it rapidly decomposes to inorganic pyrophosphate and adenosine 5'-phosphate even at 0 °C.

Precautions and Disclaimer

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