



# Adenosine



## PRODUCT IN FOCUS



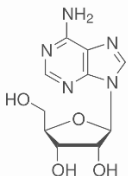
## Adenosine

### INTRODUCTION

Adenosine is a naturally occurring purine nucleoside composed of adenine and ribose, present in all living cells. It plays a vital role in biochemical processes such as energy transfer (ATP/ADP), signal transduction, and regulation of physiological functions, and is widely used in pharmaceutical applications.

### MANUFACTURE

It is manufactured mainly by biotechnological fermentation using selected microbial strains, followed by extraction, purification, and crystallization. It can also be produced by enzymatic or chemical synthesis starting from adenine and ribose derivatives under controlled conditions.

<b>Synonym(s)</b>	Adenine riboside, 9-β-D-Ribofuranosyl-9H-purin-6-amine
<b>CAS no.</b>	58-61-7
<b>EINECS no.</b>	200-389-9
<b>Molecular formula</b>	$C_{10}H_{13}N_5O_4$
<b>Molecular weight</b>	267.24
<b>Structure</b>	

### APPLICATIONS

It plays an important role in biochemical processes involving energy transfer and cellular signaling:

#### ⚡ Pharmaceutical applications:

- Used as an antiarrhythmic drug for the rapid treatment of supraventricular tachycardia (SVT).
- Helps restore normal heart rhythm by slowing conduction through the atrioventricular (AV) node.
- Used in cardiac stress testing as a coronary vasodilator.

#### ⚡ Biochemical and medical research

- Serves as a key component of ATP (adenosine triphosphate), ADP, and AMP in cellular energy metabolism.
- Used in cell signaling and receptor studies, particularly involving adenosine receptors.
- Important in neuroprotection and inflammation research.

#### ⚡ Cosmetic applications

- Used in anti-aging skincare products to help improve skin smoothness and reduce the appearance of wrinkles.
- Supports skin-repair and regeneration processes.

#### ⚡ Nutraceutical and physiological roles

- Studied for its role in sleep regulation, vasodilation, and immune response.
- Acts as a neuromodulator in the central nervous system.



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### SPECIFICATIONS – Ph Eur

Test	Unit	Specification
Description	-	White or almost white crystalline powder.
Solubility	-	Slightly soluble in water. Soluble in hot water. Practically insoluble in ethanol (96%) and in methylene chloride. It dissolves (sparingly soluble) in dilute mineral acids (dilute sulphuric acid, dilute hydrochloric acid and dilute nitric acid).
Melting point	°C	About 234
Identification by IR	-	The infrared absorption spectrum of the sample preparation should exhibit maxima only at the same wavelengths at that same wavelengths as that of a similar preparation of the Adenosine working standard.
Appearance of solution	-	Solution should be colourless
Acidity or Alkalinity	-	a. The solution should be coloured yellow upon the addition of 0.1 ml of 0.01M hydrochloric acid b. The solution should be coloured violet blue upon the addition of 0.4 ml of 0.01M sodium hydroxide
Limit of chloride	ppm	NMT 100
Limit of sulphates	ppm	NMT 200
Limit of ammonium	ppm	NMT 10
Loss on drying (for 2 hours at 105°C)	w/w	NMT 0.5
Sulphated ash	w/w	NMT 0.1
Assay by HPLC	% w/w	NLT 99.0 and NMT 101.0, calculated with reference to the dried substance



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### SPECIFICATIONS – Ph Eur ...continued

Test	Unit	Specification
<u>Related substance by HPLC</u>		
1. Impurity A	%	NMT 0.2
2. Impurity G	%	NMT 0.1
3. Impurity F	%	NMT 0.1
4. Impurity H	%	NMT 0.1
5. Single largest unknown impurity	%	NMT 0.1
6. Total impurities	%	NMT 0.5
9-(2,3,5-tri- <i>o</i> -acetyl- $\beta$ -D-Ribofuranosyl)-Adenine [condensed product]	% w/w	NMT 0.1
<u>Residual solvents</u>		
1. Methanol	ppm	NMT 1000
2. Ethanol	ppm	NMT 2000
3. Acetonitrile	ppm	NMT 200
4. Dichloromethane	ppm	NMT 300
5. Ethyl acetate	ppm	NMT 2000
Bacterial Endotoxins	EU/gm	NMT 3.0
<u>Microbial tests</u>		
- Total viable aerobic count	CFU/g	NMT 100
- Total yeast and molds	CFU/g	NMT 10
- <i>Staphylococcus aureus</i>	-	Should be absent in 1 gm
- <i>Psuedomonas aeruginosa</i>	-	Should be absent in 1 gm
- <i>Escherichia coli</i>	-	Should be absent in 1 gm
- <i>Salmonella</i>	-	Should be absent in 10 gm
Tin (Stannic) content	ppm	NMT 90



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### PACKING

HDPE drum.

### STORAGE

Keep container at controlled room temperature up to 25°C.

### CERTIFICATION

WHO-GMP, Written Confirmation (WC), DMF & CEP/COS.

ExSyn offers Adenosine on commercial scales and welcomes enquiries. Our exceptional quality and service will make ExSyn your supplier of choice! If you need any additional information or SDS, please contact us.