

Product Data Sheet

Product Name: 3-Acetylpyridine NAD

Cat. No.: GC18294

Chemical Properties

Cas. No. 86-08-8

Chemical Name adenosine 5'-(trihydrogen diphosphate), P'→5'-ester with 3-acetyl-1-β-D-ribofuranosylpyridinium, inner salt

SMILES O[C@H]1[C@H](N2C=NC3=C2N=CN=C3N)O[C@H](COP(OP(OC[C@@H]4[C@@H](O)[C@@H](O)[C@H]([N+]5=CC(C(C)=O)=CC=C5)O4)([O-])=O)(O)=O)[C@H]1O

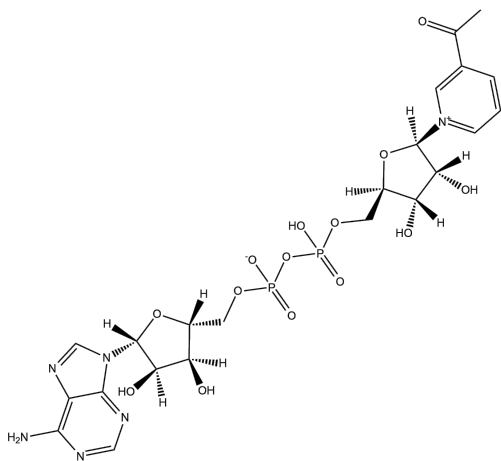
Formula $C_{22}H_{28}N_6O_{14}P_2$ M.Wt 662.4

Solubility 10mg/ml in PBS (pH 7.2) Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Background

3-Acetylpyridine NAD (APAD) is an analog of NAD⁺ (free acid), a signaling molecule and cofactor or

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substrate for many enzymes. APAD has been used to study the mechanisms of oxidative phosphorylation. It can be reduced by transdehydrogenase from NADH (sodium salt) . It can be reduced more efficiently and is more stable than NAD⁺; thus, it is useful as a substitute.

References:

- [1]. Houtkooper, R.H., Cantó, C., Wanders, R.J., et al. The secret life of NAD⁺: An old metabolite controlling new metabolic signaling pathways *Endocr. Rev.* 31(2), 194-223 (2010).
- [2]. Ciaccio, E.I. The inhibition of lactate dehydrogenase by 3-acetylpyridine adenine dinucleotide and bisulfite *J. Biol. Chem.* 241(7), 1581-1586 (1966).
- [3]. Birrell, J.A., and Hirst, J. Investigation of NADH binding, hydride transfer, and NAD(+) dissociation during NADH oxidation by mitochondrial complex I using modified nicotinamide nucleotides *Biochemistry* 52(23), 4048-4055 (2013).
- [4]. Stilwell, S.N., Bizouam, T., and Jackson, J.B. The reduction of acetylpyridine adenine dinucleotide by NADH: is it a significant reaction of proton-translocating transhydrogenase, or an artefact? *Biochim Biophys. Acta.* 1320(1), 83-94 (1997).
- [5]. Lee, H.J., Lee, S.H., Park, C.B., et al. Coenzyme analogs: Excellent substitutes (not poor imitations) for electrochemical regeneration *Chem. Commun. (Camb.)* 47(46), 12538-12540 (2011).

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