

DEPC

Diethylpyrocarbonate

Product No. A0881

Description

Formula:	C ₆ H ₁₀ O ₅
Molecular weight:	162.14 g/mol
CAS-No.:	[1609-47-8]
HS-No.:	29051990
Assay (NT):	min. 97 %
Refractive index (n 20°/D):	1.398
Density (d 20°/4°):	1.122 g/ml
Boiling point:	160 - 163°C
Working concentration:	0.1 %
Storage:	+4°C
Safety:	R: 20/22-36/37/38 S: 26-36 harmful, irritant
Disposal:	1

Comment

Diethyl pyrocarbonate (DEPC) modifies histidyl-residues in proteins and leads to the inactivation of many enzymes. In molecular biology it is mainly used as a strong, but not absolute, inhibitor of RNase activity. In addition, DEPC reacts with adenosine of single-stranded nucleic acids (2) and purines in Z-DNA (4) and B-DNA (5), respectively. For the treatment of water with DEPC, add 1 ml of DEPC to 1 liter bidistilled water (0.1 % DEPC v/v) and stir over night. Autoclaving at 20 psi for 20 minutes inactivates DEPC. DEPC reacts with water and hydrolyses to ethanol und CO₂. It is limited soluble in aqueous buffers (solubility in water max. 40 mM). DEPC in its pure form has a concentration of 6,9 M (3). As a diluent you may use anhydrous ethanol oder acetonitrile (e.g. stock solution 10 mM, Ref. 3). Autoclaving totally inactivates DEPC in solutions, even if the typical smell does not disappear (1). Since DEPC acylates histidyl- and tyrosyl-residues, do not use in combination with reagents containing these residues (e.g. Tris). Tris inactivates DEPC!

Caution: DEPC is suspected to be a carcinogen and should be handled with great care. Do not breathe fumes and avoid contact with skin! DEPC may damage eyes and mucous membranes! The combination with ammonium ions (e.g. ammonium acetate from the precipitation of nucleic acids) forms the strong carcinogen Ethylcarbamate (2).

Note: When DEPC takes up moisture, it will form air bubbles (CO₂), due to its hydrolyses!

Application and Literature

- (1) A simple method for the extraction of RNA from *E. coli* with DEPC. (Summers, W.C. (1970) *Anal. Biochem.* **33**, 459-463).
- (2) DEPC: An examination of its properties in buffered solutions with a new assay technique. (Berger, S.L. (1975) *Biochim. Biophys. Acta* **400**, 428-450).
- (3) Diethyl pyrocarbonate in nucleic acid research. (Ehrenberg, L. *et al.* (1976) *Progr. Nucl. Acid Res. Mol. Biol.* **16**, 189-262).
- (4) Modification of Histidyl residues in proteins by Diethyl pyrocarbonate. (Miles, E.W. (1977) *Methods Enzymol.* **47**, 431-442).
- (5) DEPC: A chemical probe for secondary structure in negatively supercoiled DNA. (Herr, W. (1985) *Proc. Natl. Acad. Sci. USA* **82**, 8009-8013).
- (6) Chemical reactivity of DEPC with B-DNA: Specific reactivity with short A-Tracts. (McCarthy, J.G. *et al.* (1990) *Biochemistry* **29**, 6071-6081).