

- Lehman-McKeeman LD, *et al.* Diethanolamine induces hepatic choline deficiency in mice. *Toxicol Sci* 2002; 67(1): 38–45.
- Lewis RJ, ed. *Sax's Dangerous Properties of Industrial Materials*, 12th edn. New York: Wiley, 2012; 1503.

## 20 General References

## 21 Authors

ME Quinn, PJ Sheskey.

## 22 Date of Revision

4 May 2017.

# Diethyl Phthalate

## 1 Nonproprietary Names

BP: Diethyl Phthalate

PhEur: Diethyl Phthalate

USP–NF: Diethyl Phthalate

## 2 Synonyms

DEP; diethyl benzene-1,2-dicarboxylate; diethylis phthalas; *Eastman DEP*; ethyl benzene-1,2-dicarboxylate; ethyl phthalate; *Kodaflex DEP*; *Neantine*; *Palatinol A*; phthalic acid diethyl ester.

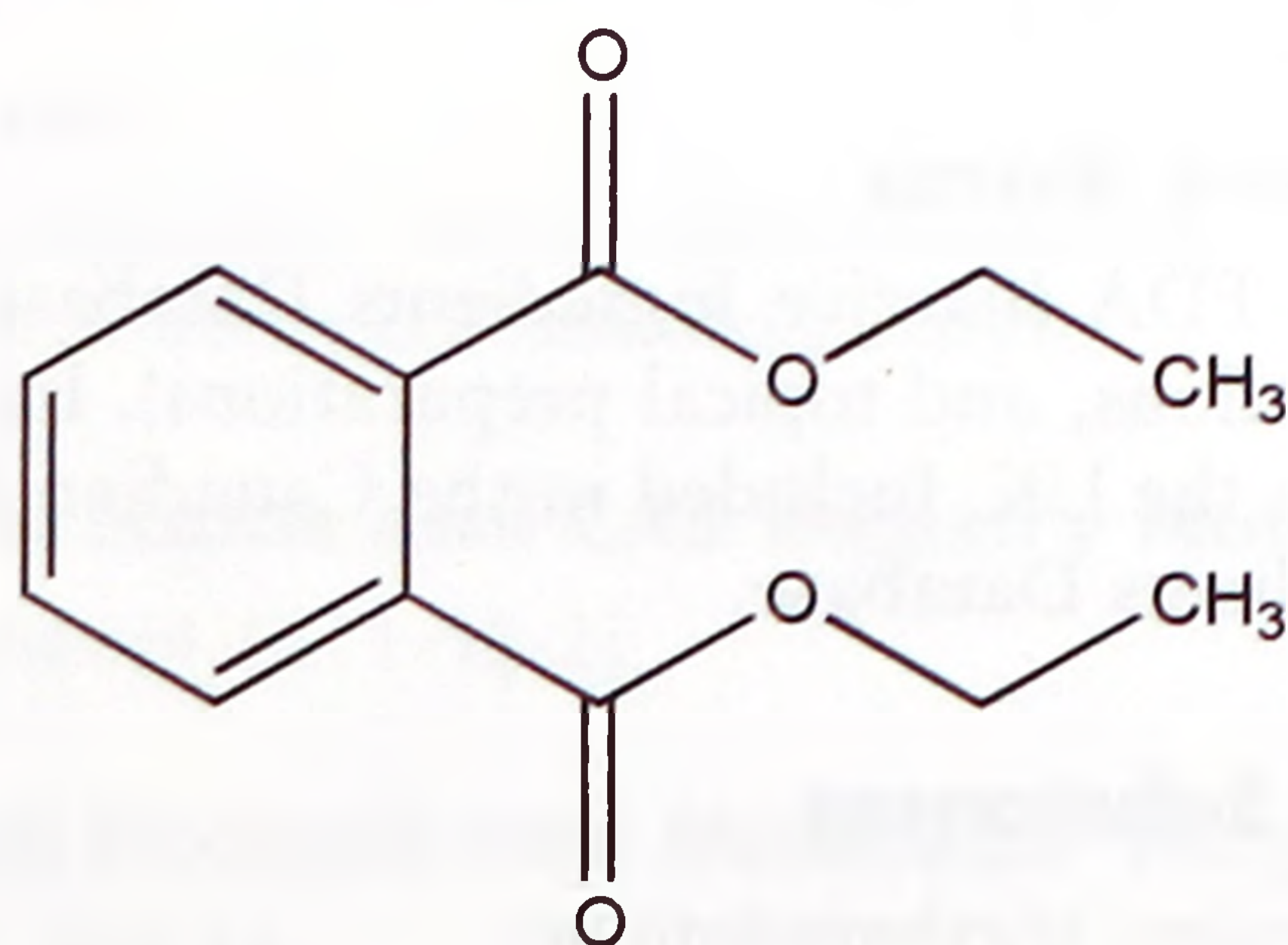
## 3 Chemical Name and CAS Registry Number

1,2-Benzenedicarboxylic acid, diethyl ester [84-66-2]

## 4 Empirical Formula and Molecular Weight

$C_{12}H_{14}O_4$  222.24

## 5 Structural Formula



## 6 Functional Category

Plasticizing agent; solvent.

## 7 Applications in Pharmaceutical Formulation or Technology

Diethyl phthalate is used as a plasticizing agent for film coatings on tablets, beads, and granules at concentrations of 10–30% by weight of polymer.<sup>(1–3)</sup>

## 8 Description

Diethyl phthalate is a clear, colorless, oily liquid. It is practically odorless, or with a very slight aromatic odor and a bitter, disagreeable taste.

## 9 Pharmacopeial Specifications

See Table I.

**Table I:** Pharmacopeial specifications for diethyl phthalate.

Test	PhEur 9.2	USP 40–NF 35 S1
Identification	+	+
Characters	+	–
Specific gravity	1.117–1.121	1.118–1.122
Refractive index	1.500–1.505	1.500–1.505
Appearance	+	–
Acidity	+	+
Related substances	+	–
Water	≤0.2%	≤0.2%
Residue on ignition	–	≤0.02%
Sulfated ash	≤0.1%	–
Assay (anhydrous basis)	99.0–101.0%	98.0–102.0%

## 10 Typical Properties

**Boiling point** 295°C

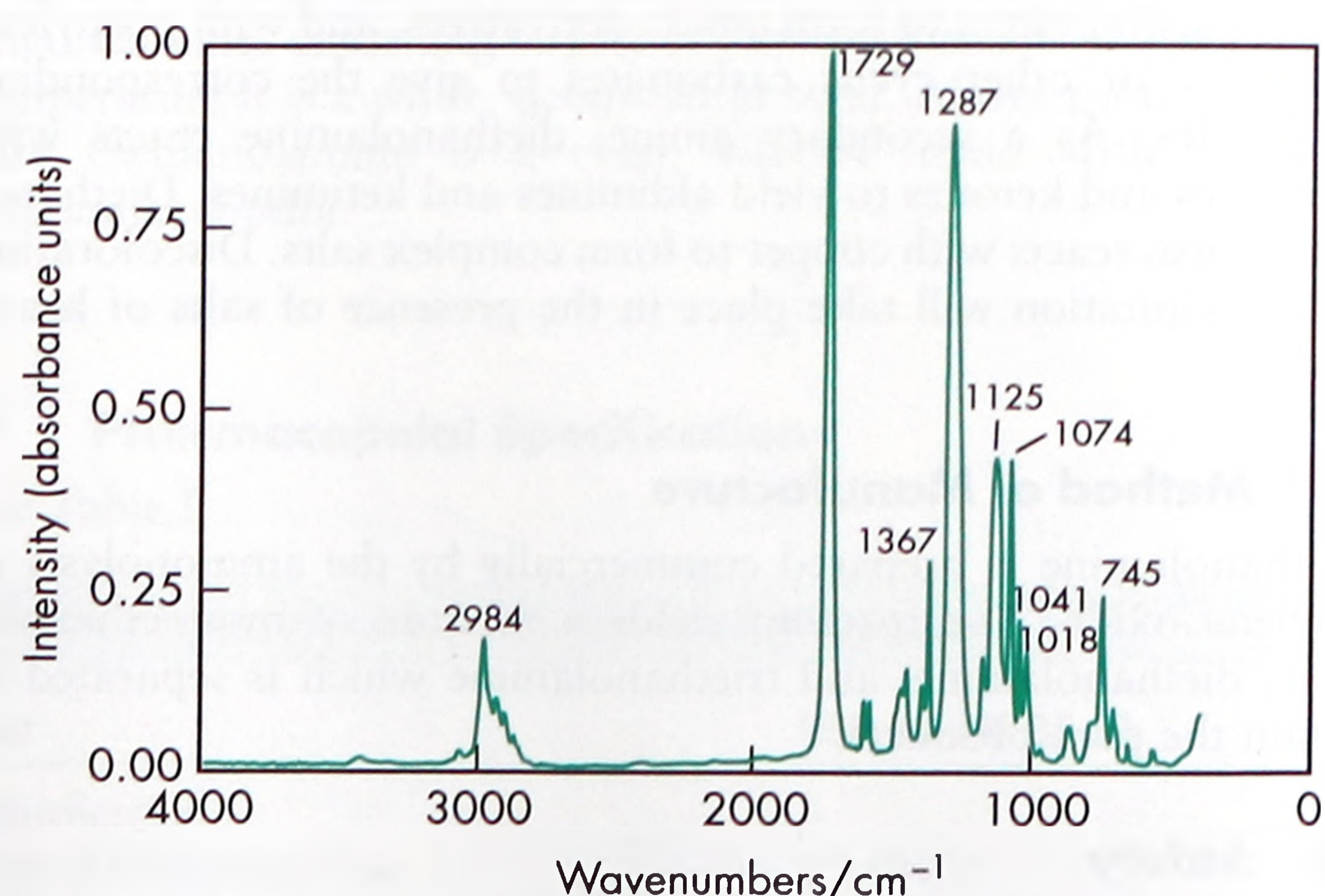
**Flash point** 160°C (open cup)

**Melting point** –40°C

**Refractive index**  $n_D^{25} = 1.501$

**Solubility** Miscible with ethanol (95%), ether, and many other organic solvents; practically insoluble in water.

**Specific gravity** 1.120 at 25°C



**Figure 1:** Infrared spectrum of diethyl phthalate measured by transmission. Adapted with permission of Informa Healthcare.