

## Product Information

### Betaine

Product Number **B 2629**

Storage Temperature 2-8 °C

#### Product Description

Molecular Formula: C<sub>5</sub>H<sub>11</sub>NO<sub>2</sub>

Molecular Weight: 117.1

CAS Number: 107-43-7

pK<sub>a</sub>: 1.83<sup>1</sup>

Melting Point: 310 °C (with decomposition)

Synonyms: oxynurine, glycine betaine, (carboxymethyl)trimethylammonium inner salt, 1-carboxy-N,N,N-trimethylmethan ammonium inner salt<sup>2</sup>

Betaine is a reagent that is used in soldering, resin curing fluxes, and organic synthesis.<sup>1</sup> Betaine compounds occur naturally in plants and animals, such as in sugar beets and marine algae. A review of the role of glycine betaine in protecting plants from environmental stress has been published.<sup>3</sup> The role of betaine and other organic osmolytes in maintaining osmolarity in mammalian cells has been reviewed.<sup>4</sup>

Betaine has been reported to diminish the base pair composition dependence of DNA thermal melting transitions, with a concentration of 5.2 M betaine being the value at which AT and GC base pairs are equally stable.<sup>5</sup> Betaine has subsequently found application in the polymerase chain reaction (PCR).<sup>6,7</sup> The usefulness of betaine in PCR has resulted from its ability to enhance DNA amplification by diminishing the formation of secondary structure in GC-rich DNA regions.<sup>8</sup> A protocol for the production of long-chain cDNAs that uses betaine and trehalose has been published.<sup>9</sup>

The permanent positive charge on betaine makes it a target of study for mass spectrometry (MS) analysis by such methods as electrospray ionization (ESI) MS.<sup>10</sup> A protocol for the analysis of betaine and other choline related compounds from tissues that combines HPLC with isotope dilution ESI-MS has been described.<sup>10</sup>

#### Precautions and Disclaimer

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

#### Preparation Instructions

This product is soluble in water (50 mg/ml), yielding a clear, colorless solution. 5 M solutions of betaine in water are available (Product No. B 0300). This product is soluble in also methanol (55 g/100 g, w/w) and ethanol (8.7 g/100 g).<sup>1</sup>

#### References

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9. Spiess, A. N., and Ivell, R., A highly efficient method for long-chain cDNA synthesis using trehalose and betaine. *Anal. Biochem.*, **301(2)**, 168-174 (2002).

10. Wood, K. V., et al., Characterization of betaines using electrospray MS/MS. *Phytochemistry*, **59(7)**, 759-765 (2002).
11. Koc, H., et al., Quantitation of choline and its metabolites in tissues and foods by liquid chromatography/electrospray ionization-isotope dilution mass spectrometry. *Anal. Chem.*, **74(18)**, 4734-4740 (2002).

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