The Solution and Solid State Structure of L-Carnitine L-Tartrate

Hubert Schmidbaur*, Annette Schier, Angela Bayler

Anorganisch-chemisches Institut der Technischen Universität München,
Lichtenbergstrasse 4, D-85747 Garching, Germany

Z. Naturforsch. **53 b,** 788–791 (1998); received May 25, 1998

Carnitine, Tartrate, Hydrogen Bonds

L-Carnitine forms a salt-like 2:1 adduct with L-tartaric acid which crystallizes in the orthorhombic space group $P2_12_12_1$ with Z = 4 formula units in the unit cell. The lattice is composed of an L-tartrate dianion and two crystallographically independent L-carnitinium cations. The two cations show only very minor differences in their conformation. Anions and cations are arranged in separate stacks which are linked via hydrogen bonds. The tartrate anion and the carnitinium cations show standard geometries known from the structures of other salts of these ions, like the L-carnitine component of the R,L-carnitinium chloride or the dianion in alkali tartrates. The title compound has galenic advantages as an L-carnitine drug because of its non-hygroscopic properties. Aqueous solutions have been shown to contain solvated ionic components, *i.e.* L-tartrate and L-hydrogentartrate anions, L-tartaric acid (15:70:15) and carnitinium cations. The title compound can therefore be classified as a genuine L-carnitinium salt of L-tartaric acid.

Reprint requests to Prof. Dr. H. Schmidbaur.