sigma-aldrich.com
3050 Spruce Street, Saint Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Chlorophyll a
from *Anacystis nidulans* algae

Product Number **C 6144**
Storage Temperature -0 °C

Product Description
Molecular Formula: $C_{55}H_{72}MgN_4O_5$
Molecular Weight: 893.5
CAS Number: 479-61-8
λ_{max}: 428, 662 (diethyl ether)[1]
Extinction coefficients: E^{mM} = 106-122 (428 nm), 82.9-88.4 (660 nm)(ether); E^{mM} = 136-168 (428 nm), 111-137 (660 nm)(acetone)

This product is a green pigment involved in photosynthetic reactions. It is one of the most important Mg^{2+} complexes in nature. It is capable of channelling the energy of sunlight into chemical energy through the process of photosynthesis. In photosynthesis, the energy absorbed by chlorophyll transforms carbon dioxide and water into carbohydrates and oxygen. In the photosynthetic reaction, carbon dioxide is reduced by water; that is, electrons are transferred from water to carbon dioxide. Chlorophyll assists in this transfer. When chlorophyll absorbs light energy, an electron in chlorophyll is excited from a lower energy state to a higher energy state. In this higher energy state, the electron is more readily transferred to another molecule. This starts a chain of electron-transfer steps, which ends with an electron transferred to carbon dioxide. Meanwhile, the chlorophyll which gave up an electron can accept an electron from another molecule. This is the end of a process, which started with the removal of an electron from water. Thus, chlorophyll is at the center of the photosynthetic oxidation-reduction reaction between carbon dioxide and water.

During production of this product from *Anacystis nidulans*, no solutions containing metal ions are used. When analyzing this product by absorbance, it appears that there is a marked dependence on solvents for determination of the extinction coefficients of Chlorophyll a in the visible spectrum.[1]

This product is reported to inhibit lipoxidase in growing pea plants.[2] It also has ionization potential in aqueous enviroments.[3] It has been used in the photosensitization of the NAD^+-ascorbate reaction.[4] Spectral absorption properties of chlorophyll a and b have been reported.[1]

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

Preparation Instructions
This product is soluble in ethanol (10 µg/ml). It is also freely soluble in acetone, benzene, ether, and chloroform, but is not soluble in water.[5,6]

Storage/Stability
Since Chlorophyll a is sensitive to light, solutions will be unstable when exposed to light. In ethanol solutions, this product is converted to chlorophyll B quickly (approximately 30% decomposition after 30 minutes by HPLC analysis).

References
1. Strain, H. H., et al., Biochim. Biophys. Acta, **75**, 306 (1963).
2. Cohen, B-S., et al., Chlorophyll Inhibition of Lipoxygenase in Growing Pea Plants. J. Agric. Food. Chem., **32**, 516-519 (1984).
3. Bernas, D., et al., On the Ionization Potential of Chlorophyll and Bacteriochlorophyll in Aqueous Environment. Chem. Phys. Lett., **104(1)**,105-108 (1984).
4. Dijkmans, C., et al., Photosensitization of the NAD^+-Ascorbate Reaction by Lecithin Vesicles Containing Chlorophyll a. Photosynthetica, **17**, 391-394 (1983).
5. The Merck Index, 11th ed., Entry# 2155
6. Data for Biochemical Research, 3rd ed., Dawson, R. M. C., et al., Oxford University Press (New York, NY: 1986), p. 232.

CMH/NSB 2/08