

## Product Information

### L- $\alpha$ -Phosphatidylcholine

Product Number **P 4279**

Storage Temperature -0 °C

#### Product Description

CAS Number: 8002-43-5

Synonyms: L- $\alpha$ -Lecithin, 3-*sn*-Phosphatidylcholine,

Typical lots of egg yolk phosphatidylcholine have fatty acid contents of approximately 33% C16:0 (palmitic), 13% C18:0 (stearic), 31% C18:1 (oleic), and 15% C18:2 (linoleic) (other fatty acids being minor contributors), which would give an average molecular weight of approximately 768.

The crystalline transition temperature (gel-to-liquid) for phosphatidylcholine from egg is -15 °C for the heating curve and -7 °C for the cooling curve.<sup>1,2</sup>

Phosphatidylcholine is the major membrane phospholipid in eukaryotic cells. In addition to being the major structural component of cellular membranes, phosphatidylcholine serves as a reservoir for several lipid messengers. It is the source of the bioactive lipids lysophosphatidylcholine, phosphatidic acid, diacylglycerol, lysophosphatidylcholine, platelet-activating factor, and arachidonic acid.<sup>3</sup> An understanding of the control and regulation of the several metabolic pathways involved in the formation of these bioactive lipids is an ongoing science.

Phosphatidylcholine is used for preparation of vesicle suspensions commonly called liposomes or as monolayers. There have been several books published on liposomes and their applications.<sup>4,5</sup> Monolayers have been formed using a solution of 1% soybean phosphatidylcholine in hexane.<sup>6</sup>

Valinomycin induced changes in membrane potentials of red blood cell and phospholipid (phosphatidylcholine from egg yolk plus cholesterol) vesicle suspensions have been measured using positively-charged, cyanine dyes that fluorimetrically responded to the change in potential.<sup>7</sup>

Purified rhodopsin has been incorporated into soybean phosphatidylcholine vesicles.<sup>8</sup>

A procedure for determination of the amount of oxidation of egg phosphatidylcholine in a liposome preparation by measurement of the oxidation index has been published.<sup>9</sup> The oxidation index is the ratio of the absorbance at 233 nm to the absorbance at 215 nm. The latter wavelength was chosen since there is little contribution of the fatty acid carbonyl to the absorbance at this wavelength, allowing Beer's Law to be followed. A method of determining choline content has been published.<sup>10</sup>

Phosphatidylcholine is purified by a modification of the chromatography method of Singleton by passing an extract of egg yolk through an alumina column.<sup>11</sup> This product is prepared by dissolving in 200 proof ethyl alcohol (100 mg/ml).

#### Precautions and Disclaimer

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

#### Preparation Instructions

Purified egg L- $\alpha$ -phosphatidylcholine is soluble (100 mg/ml) at room temperature in chloroform, ethanol, and hexane containing 3% ethanol. These solubility characteristics should generally apply to other purified natural product phosphatidylcholine products such as from egg, soybean, and brain that contain unsaturated fatty acids.

#### References

1. BioPharm, April 1990.
2. Chapman, D., et al., Physical studies of phospholipids. VI. Thermotropic and lyotropic mesomorphism of some 1,2-diacyl-phosphatidylcholines (lecithins). *Chem. Phys. Lipids*, **1**, 445-475 (1967).
3. Kent, C. and Carman, G. M., *Trends in Biochemical Sciences*, **24(4)**, 146-150 (1999).
4. *Stealth Liposomes*, Lasic, D., and Martin, F., CRC press (Boca Raton, FL: 1995).

5. Liposomes in Gene Delivery, Lasic, D. D., CRC press (Boca Raton, FL: 1997).
6. Cassia-Moura, R., Bioelectrochemistry and Bioenergetics, **32**, 175-180 (1993).
7. Sims, P. J., et al., Studies on the mechanism by which cyanine dyes measure membrane potential in red blood cells and phosphatidylcholine vesicles. Biochemistry, **13(16)**, 3315-3330 (1974).
8. Guy, P. M., et al., Rhodopsin-stimulated activation-deactivation cycle of transducin: kinetics of the intrinsic fluorescence response of the alpha subunit. Biochemistry, **29(30)**, 6954-6964 (1990).
9. Klein, R. A., The detection of oxidation in liposome preparations. Biochim. Biophys. Acta., **210(3)**, 486-489 (1970).
10. Ackerman, C. J., and Salmon, W. D., Anal. Biochem., **1**, 327-336 (1960).
11. Singleton, W. S., et al., J. Am. Oil Chem. Soc., **42**, 53 (1965).

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