

# PMLs CONTAINING VITAMIN A PALMITATE (5%) AND VITAMIN E ACETATE (5%)

CODE: PL030

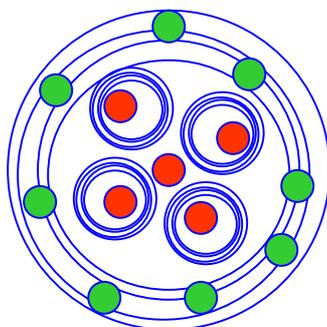
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## GENERAL DESCRIPTION

Liposomes are spherical vesicles comprised of specific types of lipids. They can contain proteins, peptides or other active ingredients that are important for maintaining the strength and the tone of skin and hair. Liposomes interact with the cells of the epidermis and release their contents inside them. Plurilamellar Multivesicular Liposomes (PMLs) are a specific kind of liposome composed by several concentric bilayers that contain various vesicles.

PMLs are liposomes entrapping liposomes and can encapsulate large amounts of both hydrophilic and hydrophobic active ingredients. Hydrophobic actives are contained within the liposomes and hydrophilic actives are trapped between bilayers as shown Fig. 1.



- Hydrophilic (Inside Liposome)
- Hydrophobic (Between Bilayers)
- Phospholipids

**Fig. 1.** Structure of a PML

PMLs are obtained with microfluidising techniques and are coated with a colloidal hydrophilic matrix that makes them stable in emulsions.

Phospholipids used for the preparation of these liposomes are of plant origin (Soybean lipids) and are stabilized by Carrageenans (seaweeds of marine origin) which protect the liposomal structure from tensioactives and therefore allow their use in emulsions.

PMLs CONTAINING VITAMIN A PALMITATE (5%) AND VITAMIN E ACETATE (5%) are polycentric vesicles of phospholipids that contain stabilised forms of Vitamins A and E and have the capacity to release the active ingredient into the epidermis.

The main benefit from VITAMIN A and its derivatives lies in their ability as retinoids to regulate epithelial cell growth and differentiation. This family of compounds called retinoids has been shown to have receptor-specific effects on the skin, resulting in decreased roughness and decreased facial wrinkling. Retinyl palmitate, a vitamin A ester, has been added to cosmetics for years. It has a large molecular weight and is stable in formulation. VITAMIN A PALMITATE must be enzymatically converted in the skin first to retinol by cleavage of the ester bond, then the retinol must be converted by a two-step oxidative process into the active tretinoin (all-trans-retinoic acid). In a famous study, topical Vitamin A palmitate administered for fourteen consecutive days on hairless mice resulted in an increase in protein and collagen as well as DNA content and increased epidermal thickening (Counts DF, Skreko F, McBee J, et al. The effects of retinyl palmitate on skin composition and morphometry. J Soc Cosmet Chem 1988;39:235– 40).

The primary mechanism of action to justify VITAMIN E's importance is its potent antioxidant ability. Because of this ability to quench free radicals, especially lipid peroxy radicals, the term "protector" has been used to describe the actions of vitamin E and its derivatives. Several studies show their ability to reduce UV-radiation-induced erythema and edema, sunburn cell formation, and lipid peroxidation (Trevithick JR, Xiong H, Lee S, et al. Topical tocopherol acetate reduces post-UVB sunburn-associated erythema, edema, and skin sensitivity in hairless mice. Arch Biochem Biophys 1992;296:575– 82).

PMLs CONTAINING VITAMIN A PALMITATE (5%) AND VITAMIN E ACETATE (5%) have been dispersed into a colloidal polymeric matrix that forms a very thin layer when spread on the skin and hair, allowing its diffusion throughout the upper layers of the epidermis in a controlled and sustained release manner. This system initiates the RETARD concept in the Cosmetic Technology.

## PROPERTIES AND APPLICATIONS

PMLs CONTAINING VITAMIN A PALMITATE (5%) AND VITAMIN E ACETATE (5%) are totally compatible with creams, milks and gels due to their hydrophilic coating. Therefore, these liposomes can be easily incorporated into skin care products. Its protecting effect and assistance to the natural cell growth processes are particularly important in suntan formulations, baby care products, skin creams or gels, shaving creams and lotions.

In all cases these liposomes impart lubricity and moisture to the surface of the skin and hair.

## **TECHNICAL INFORMATION**

### **PRODUCT SPECIFICATIONS**

Appearance:	Suspension
Colour:	Yellow to Brown
Active ingredient content:	5% Vitamin A Palmitate 5% Vitamin E Acetate
pH:	5.5 - 6.5
Solvent:	Demineralised water
Preservatives:	Phenonip 0.5%, Biopure 0.1%

### **PROCESSING AND DOSAGE**

PMLs CONTAINING VITAMIN A PALMITATE (5%) AND VITAMIN E ACETATE (5%) can be incorporated into the finished emulsion in the final step at 35 - 40 °C. Care should be taken not to exceed 50 °C.

A dosage of 3 - 10% of liposome suspension is recommended to ensure efficacy on the epidermis and hair in body and hair care formulations.

### **STORAGE AND SHELF LIFE**

Keep in a clean, cool and dark place. If product is stored as recommended it will remain stable for at least 18 months.

### **SAFETY**

All the raw materials involved in the formulation are regarded safe in terms of skin irritation, sensitivity, ophthalmic irritation, oral and cutaneous toxicity

## GENERAL PRODUCT INFORMATION

<b>Trade name</b>	PMLs CONTAINING VITAMIN A PALMITATE (5%) AND VITAMIN E ACETATE (5%)
<b>Product code</b>	PL030

## INGREDIENTS

<b>INCI name</b>	<b>CAS No</b>	<b>EINECS No</b>
WATER (AQUA)	7732-18-5	231-791-2
RETINYL PALMITATE	79-81-2	201-228-5
TOCOPHERYL ACETATE	7695-91-2	231-710-0
PHOSPHOLIPIDS	-	-
HYDROGENATED LECITHIN	92128-87-5	295-786-7
CARBOMER	9007-16-3	N.L. <sup>a</sup>
TRIETHANOLAMINE	102-71-6	203-049-8
CARRAGEENANS (CHONDRUS CRISPUS)	9000-07-1	232-524-2
ALCOHOL DENAT.	64-17-5	200-578-6
BHT	128-37-0	204-881-4
TOCOPHEROL	1406-18-4	215-798-8
<del>DISODIUM EDTA</del>	<del>6381-92-6</del>	<del>205-358-3</del>
<del>PHENOXYETHANOL</del>	<del>122-99-6</del>	<del>204-589-7</del>
<del>METHYLPARABEN</del>	<del>99-76-3</del>	<del>202-785-7</del>
<del>ETHYLPARABEN</del>	<del>120-47-8</del>	<del>204-399-4</del>
<del>PROPYLPARABEN</del>	<del>94-13-3</del>	<del>202-307-7</del>
<del>BUTYLPARABEN</del>	<del>94-26-8</del>	<del>202-318-7</del>
<del>ISOBUTYLPARABEN</del>	<del>4247-02-3</del>	<del>224-208-8</del>
<del>IMIDAZOLIDINYL UREA</del>	<del>39236-46-9</del>	<del>254-372-6</del>

<sup>a</sup> Not Listed