

# Glycosphere-PCOGs

## The anti-aging power of plant polyphenols



### Procyanidolic Oligomers (PCO)

PCOs are natural anti-oxidants and free radical scavengers, extracted from many plants. The most common sources are grape seed and pine tree bark. These polyphenols have proved to be excellent free-radical scavengers, with much higher activity than Vitamin E and Vitamin C. PCOs can be used with benefits in skin care products to promote bio-synthesis, maintenance and repair of collagen, and to increase the smoothness and strength of the dermis.

However, PCOs are unstable in cosmetic formulations and under irradiation, rapidly losing their activity and discoloring emulsions they are added to.

### Glycospheres-PCOGs

Glycospheres are submicron delivery systems. They can entrap PCOs within their hydrophilic inner core, separating them from the constituents of the formulas and protecting them from degradation. PCOs keep their free-radical scavenging activity after entrapment, making Glycospheres-PCOGs the ideal system to bring the power of these plant polyphenols into skin care formulas.

### In vitro test 1 - DPPH test:

2,2-diphenyl-1-picrylhydrazyl (DPPH\*, a stable free radical) in vitro test has been used to show the capacity of PCO to scavenge free radicals. In this test, we compared the anti-free radical activity of grape PCO, either in solution or entrapped in Glycospheres with  $\alpha$ -tocopherol (Vitamin E) by measuring the concentration (EC50) in antioxidant necessary to modify 50% of DPPH (note: the results below are expressed as 1/EC50)

- PCO in solution:	467
- Glycospheres-PCOG:	513
- $\alpha$ -tocopherol:	154

This test shows that PCOs are much more potent free-radical scavengers than Vitamin E and, while Glycospheres protect PCOs from degradation, they do not modify their activity.

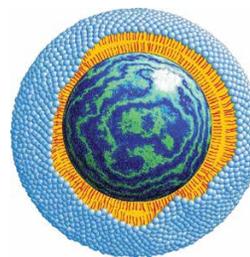
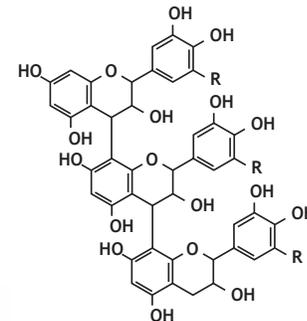
### In vitro test 2 - NBT test:

We used Nitroblue Tetrazolium (NBT) in vitro test to demonstrate the ability of PCOs to inhibit the formation of the superoxide radical ( $O_2^{\cdot-}$ ), generated by UV light during the test (note: the results below are expressed as relative activity compared to PCO in solution).

- PCO in solution:	100
- Glycospheres-PCOG:	147
- $\alpha$ -tocopherol:	-27

While Vitamin E is not active in the conditions of our test, PCOs show a very high level of activity. However, PCOs are not stable under UV light: a solution of PCO has a much lower activity than Glycospheres-PCOG, which remain stable during the test.

Procyanidolic oligomers: chemical structure of a trimer



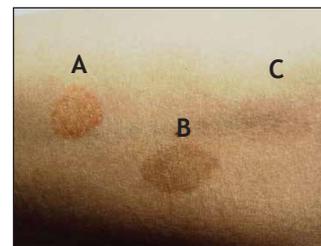
Glycospheres are based on a stable inner core, made of a network of cross-linked starch. This polysaccharide has been modified with a quaternary ammonium, which allows it to bind and entrap poly-anions like PCOs. The core is surrounded by lipid layers which helps protect the entrapped molecules.

#### INCI name:

Water (And) Pentylene Glycol (And) Palmitoyl Hydroxypropyltrimonium Amylopectin/Glycerin Crosspolymer (And) 1,2-Hexanediol (And) Caprylyl Glycol (And) Vitis Vinifera (Grape) Seed Extract (And) Hydrogenated Lecithin

### In vivo Dithranol test:

when applied to the skin, Dithranol generates free-radicals, which create an erythema (A). If the skin has been protected with a solution of PCOs, the erythema is reduced (B). Application of a suspension of Glycospheres-PCOG instead of the solution almost eliminates the erythema (C).



#### Applications

- Gs-PCOGs are used as free-radical scavengers in anti-aging or anti-inflammatory products, hair care, anti-dark circle eye cream or whitening formulas
- Gs-PCOGs is best formulated by replacing part of the water in the formula by the Glycosphere suspension
- Recommended use level is between 1 and 5%

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KFL-181G

# Daily Facial Correcting Cream with HEV/Blue Light Protection

## Part 1

- Deionized Water - Water 62.30%
- Natrosol™ Plus 330CS - Ashland: *Cetyl Hydroxyethylcellulose* 0.55%

## Part 2

- Butylene Glycol - Ruger Chemical: *Butylene Glycol* 3.00%
- Glycerin U.S.P.F.C.C. 96% - Ruger Chemical: *Glycerin* 1.00%
- D-Panthenol - BASF: *Panthenol* 0.30%
- Dermofeel® PA-3 - Dr. Straetmans/Evonik: *Sodium Phytate* 0.15%
- ALLANTOIN - RITA: *Allantoin* 0.15%
- Trisodium Citrate Dihydrate - Jungbunzlauer: *Sodium Citrate* 0.05%

## Part 3

- Lecinol S-10 - Barnet: *Hydrogenated Lecithin* 0.30%

## Part 4

- TNP45TELR - Kobo Products: *Titanium Dioxide (And) C12-15 Alkyl Benzoate (And) Stearic Acid (And) Silica (And) Alumina (And) Polyhydroxystearic Acid (And) Iron Oxides (CI 77491)* 8.60%
- SunBoost ATB - Kobo Products: *Argania Spinosa Kernel Oil (And) Tocopheryl Acetate (And) Bisabolol* 3.50%
- Dermol 25B - Alzo Chemical: *C12-15 Alkyl Benzoate* 2.00%
- Lipocol® C - Vantage: *Cetyl Alcohol* 0.50%
- Lanette® 22 - BASF: *Behenyl Alcohol* 0.50%
- Tegin® M Pellets - Evonik: *Glyceryl Stearate* 0.40%
- Plurol Diisostearique CG - Gattefosse: *Polyglyceryl-3 Diisostearate* 0.10%

## Part 5

- Silwax® D02 - Siltech LLC: *Ethyl Methicone* 4.75%
- TMF-1.5 - Shin-Etsu: *Methyl Trimethicone* 1.50%
- MSS-500W - Kobo Products: *Silica* 1.50%

## Part 6

- CSG-1001 - Avantor/Kobo Products: *Water (And) Dimethicone (And) Dimethicone/Vinyl Dimethicone Crosspolymer (And) Dimethiconol (And) Butylene Glycol (And) Carbomer (And) Phenoxyethanol (And) Sodium Hydroxide* 4.00%
- SILICA SHELLS - Kobo Products: *Silica* 0.30%

## Part 7

- Jeechem 400 - Jeen International: *PEG-8* 1.70%
- AE Preserve® PCG - AE Chemie: *Phenethylalcohol (And) Caprylhydroxamic Acid (And) Glycerin* 1.00%
- Gs-PCOGS - Kobo Products: *Water (And) Pentylene Glycol (And) Palmitoyl Hydroxypropyltrimonium Amylopectin/Glycerin Crosspolymer (And) 1,2-Hexanediol (And) Caprylyl Glycol (And) Vitis Vinifera (Grape) Seed Extract (And) Hydrogenated Lecithin* 0.25%

## Part 8

- Simulgel® INS-100 - Seppic Inc.: *Hydroxyethyl Acrylate / Sodium Acryloyldimethyl Taurate Copolymer (And) Isohexadecane (And) Polysorbate 60* 1.50%
- CE-181459 Foundation Essence Powdery - Custom Essence: *Fragrance* 0.10%

## Manufacturing Procedure:

1. In the main vessel, sprinkle Natrosol™ Plus into the deionized water (Part 1) with fast speed propeller mixing. While mixing, add Part 2 ingredients, one at a time, while heating to 75-80°C.
2. When Parts 1 and 2 reach 75-80°C, mix for 15 to 20 minutes. Then cool to 60-65°C. At 60-65°C, sprinkle Part 3 into Parts 1 and 2. Fast speed propeller mix for 15 minutes.
3. Heat Part 4 to 75-80°C with moderate stirring. Mix well until all ingredients are dissolved and phase is uniform.
4. Pre-mix Part 5 with fast speed propeller mixing. Mix well until the phase is completely smooth and uniform.
5. Mix Part 5 into Part 4 while maintaining temperature at 75°C.
6. Add Parts 4 and 5 to Parts 1, 2 and 3 with slow to moderate speed homogenization. Begin to ambient cool batch.
7. When batch is uniform, add Part 6, one at a time, with slow homogenization. Mix until uniform. Transfer batch to a fast sweep or moderate speed propeller.
8. When temperature of batch reaches 45°C, add premixed Part 7.
9. Transfer batch back to the homogenizer and add pre-mixed Part 8 to batch.
10. Sweep batch to 35-40°C

## Description:

This Facial Correcting Cream is a tinted (BB) cream that spreads easily, leaving skin moisturized with minimal whitening. TNP45TELR provides HEV/Blue Light protection with a slight tint to minimize skin whitening. SunBoost ATB provides skin soothing properties. The combination of MSS-500W and CSG-1001 gives the product a smooth application and nice after feel. SILICA SHELLS provides oil control properties. Gs-PCOGS provides the anti-aging properties of Grapeseed PCOs (procyanidolic oligomers).