

## *PCA.Na* *CARBOXYLIC PIRROLIDON ACID SODIUM SALT*

### *Moisturizing Property*

In cosmetic practice it is well known that to keep the skin beautiful and healthy it is necessary to keep it constantly in the right state of hydration. If this state is altered it's fundamental to restore and maintain it. For this reason the active hydrating principles are the object of interest.

In this leaflet we would like to introduce a widely used ingredient thanks to its exceptionally high hydrating factor: Carboxylic pyrrolidone acid

It can be found everywhere in the body (blood, brain, kidneys, urine, plasma, etc.) even if only in micro-moli doses and with different concentrations depending on its location.

Its presence comes in massive quantities (together with the sodium salt) in the skin's superficial protective layer, on the horny layer known as the cutaneous hydrolipidic film.

This hydrolipidic mix is responsible for maintaining the right degree of skin hydration, as everybody knows. In particular it's the fraction found in the watery phase of the mix, made of hydrosoluble and hygroscopic substances, that cause this restoration and maintenance of the skin moisture.

#### NMF % cutaneous composition

|  |      |
|--|------|
| Aminoacid                                | 40,0 |
| 2-pirrolidone carboxylic                 | 12,0 |
| Lactates + Lactic acid                   | 12,0 |
| Urea                                     | 7,0  |
| Urocanic ACID                            | 3,0  |
| Mineral salts (Na, Mg, K, Ca, Cl, PO4)   | 15,0 |
| Others (nitrated, citrates, ac. organic) | 11,0 |

The sodium salt, as opposite to the acid, is soluble in water and is used in cosmetics for this very reason. We will refer to it in the accompanying charts and notes.

#### PROPERTIES AND USES

Its high water retention capacity is one of the most important biological functions carried out by this molecule. In proving this point, simply comparing this capacity with the water retention percentage of some well known wetting agents largely used in cosmetics is adequate. A solution at 50% sodium PCA is capable of absorbing a quantity of water 50% superior to glycerine, double compared to propylene glycol and six times more than sorbitol (see related graph on the side).

The sodium salt is often used in the cosmetic mix especially when the objective is to create a product with a high hydrating and emollient action and in particular in anti-ageing products.

It can be used in emulsion form (all kinds of creams and milks) but also in lotions, gels, face masks, make up products (i.e. lipsticks, foundation creams) massive dose phials, pharmaceuticals for various topical use, etc.

It's important, when making the emulsions, to add the product in the watery phase, so that it will blend immediately.

#### INCI NAME

Sodium PCA

#### PHYSICO-CHEMICAL CHARACTERISTICS

|                                    |                   |
|------------------------------------|-------------------|
| ASPECT:                            | watery solution   |
| COLOUR:                            | clear             |
| TITLE IN PCA SODIUM SALT (cont.%): | 50,0              |
| PH VALUE (soluz. acq. 0,5%):       | 6,8 - 7,4         |
| SPECIFIC WEIGHT (a 25°C):          | 1,26 - 1,30       |
| CHLORIDES (%):                     | max 0,07          |
| AMMONIA (%):                       | max 0,02          |
| SULPHATES (%):                     | max 0,03          |
| HEAVY METALS (Pb)(%):              | max 0,02          |
| ARSENIC (%):                       | max 0,002 (2 ppm) |
| TOTAL NITROGEN (%):                | 4,45 - 4,82       |

#### TOXICITY CHARACTERISTIC

The 2-pirrolydon carboxylic acid sodium salt is to be considered a cosmetic ingredient of high affidability and security. It's non-toxic (its LD50 is equal to 10.400 mg/kg p.c.) and it doesn't cause cutaneous irritation or sensitization.

