

CROTEIN CASHMERE PE

DS-250R-1

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## CROTEIN CASHMERE PE

*Luxury for Hair and Skin Care*

**INCI Name: Aqua (and) Hydrolyzed Keratin**

**CROTEIN CASHMERE PE** is an amino acid complex produced by the careful hydrolysis of the keratin fibers of cashmere wool. With connotations of luxury, comfort and softness, this is an appealing “added value” ingredient for a wide range of skin, hair and nail care applications.

Amino acids are hygroscopic and exhibit powerful moisture binding properties. Due to their low average molecular weight, they are able to penetrate the hair cuticle to help prevent breakage and split ends. They also penetrate the stratum corneum to moisturize from within. Amino acids display a natural substantivity to skin, hair and nails making them suitable for both leave-on and rinse-off applications.

### Benefits:

- Made from pure cashmere – soft, luxurious and exclusive
- Powerful moisture binding properties
- Substantive to both skin and hair
- Does not build up
- Penetrates the hair cuticle and stratum corneum and moisturizes from within

### Features:

- Alcohol tolerant (up to 50% ethanol)
- Compatible with anionics, amphoteric, cationics and nonionics
- 20% active
- Average MW = 150

### Applications:

#### Hair:

- Conditioning shampoo
- Hair conditioners
- Intensive conditioning treatments
- Aqueous alcoholic hair sprays
- Styling products

#### Skin:

- Facial moisturizers
- Body creams and lotions
- Color cosmetics
- Skin cleansers and washes
- Sun care
- Hand and nail treatments

Croda Inc 300-A Columbus Circle, Edison, NJ 08837 Tel 732-417-0800 Fax 732-417-0804 Website www.crodausa.com Sederma, Inc. Tel 732-692-1652 Fax 732-417-0804 Croda Inc West Coast Sales Office 9545 Santa Anita Ave, Rancho Cucamonga, CA 91730 Tel 909-980-2510 Fax 909-476-7304 Croda Miami Inc 200 South Park Road, Suite 303, Hollywood, FL 33021 Tel 1-888-84CRODA Fax 954-989-8186 Sol Kaplan & Son PO Box 240234 Memphis TN 38124-0234 Tel 901-685-0323 Fax 901-763-3612 Croda Canada Ltd 221A Racco Parkway, Vaughan, Ontario L4J8X9 CANADA Tel 905-886-1383 Fax 905-886-4753

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**CROTEIN CASHMERE PE**

The intrinsic moisture binding characteristics of proteins and their derivatives are well known. Amino acids exhibit maximum moisture binding properties due to breakage of peptide links, resulting in additional hydrophilic carboxyl and amino groups. The amino acids are moisture retentive but non-sticky. Despite their differing composition, amino acid mixtures derived from a variety of proteins show remarkably similar moisture binding properties. Within experimental error, the moisture isotherm curves for keratin, collagen, maize, wheat and silk proteins are essentially identical.

Traditionally, “conditioning treatments” for hair focus on the hair surface since it is generally recognized that it is the state of the cuticle which is primarily responsible for the characteristics perceived as “condition”. In order to influence the strength/elasticity of hair, it is necessary for the conditioning agent to penetrate into the cortex or indirectly influence the state of the cortex. Claims for the ability of conditioning agents to penetrate into hair have become increasingly common in product advertising. Amino acid complexes provide an opportunity for penetration into the hair fiber due to their substantivity and small size.

**Composition**

**CROTEIN CASHMERE PE** is a mixture of individual amino acids along with trace quantities of di- and tri-peptides. The amino acid distribution is shown in Table 1.

<b>Amino acid</b>	<b>%w/w</b>
Alanine	6.2
Arginine	9.3
Aspartic acid	8.2
Cystine	2.6
Glutamic acid	17.2
Glycine	10.9
Histidine	1.0
Isoleucine	3.1
Leucine	7.6
Lysine	3.8
Methionine	0.7
Phenylalanine	2.0
Proline	6.3
Serine	8.4
Threonine	5.8
Tyrosine	1.8
Valine	5.1

Table 1: Amino acid distribution of **CROTEIN CASHMERE PE**

**CROTEIN CASHMERE PE*****Claim Substantiation*****Assessment of Substantivity and Penetration into Hair Fibers**

The impressive substantivity and degree of penetration of **CROTEIN CASHMERE PE**, when delivered from both a shampoo and conditioner system, have been proven using radiolabelling techniques.

**Method**

The use of radioactive  $^{14}\text{C}$  labeled amino acids enables both total substantivity to hair and the extent of penetration to be determined. This is because  $^{14}\text{C}$  emits weak beta-radiation which has very low penetration through materials. Therefore it is necessary to use a “contact” liquid scintillant to detect and measure the radiation and this means that only the  $^{14}\text{C}$  directly in contact with the scintillant (that is, on the surface of the hair) is measured. This gives the surface substantivity. By hydrolyzing the hair to solubilize it, and repeating the radioactivity measurements, the total substantivity can be determined. By difference, the amino acids penetrating into the hair (cortex) can be calculated. The details of the test procedure have been published<sup>1</sup>.

**Test Protocol**

Triplicate 100mg swatches of normal brown hair were used. The tresses were washed with SLES, rinsed and blotted dry then washed with the  $^{14}\text{C}$  spiked shampoo, rinsed and blotted dry again. Radioactivity was monitored on the hair surface by immersing it in liquid scintillant. The hair swatch was removed from the liquid scintillant and recounted to determine washed out radioactivity then solubilized in sodium hydroxide for 48 hours. After peroxide treatment, the total radioactivity on the hydrolyzed hair solution was measured in duplicate using a liquid scintillation counter. The effect of successive treatments was determined by repeating washing with the spiked shampoo before progressing through the protocol.

The entire procedure was repeated with spiked conditioner formulation in place of spiked shampoo formulation.

**Results**

The results obtained were used to give values for total substantivity, surface substantivity and penetration in to the hair and are illustrated graphically in figures 1-4.

CROTEIN CASHMERE PE

Shampoo Results

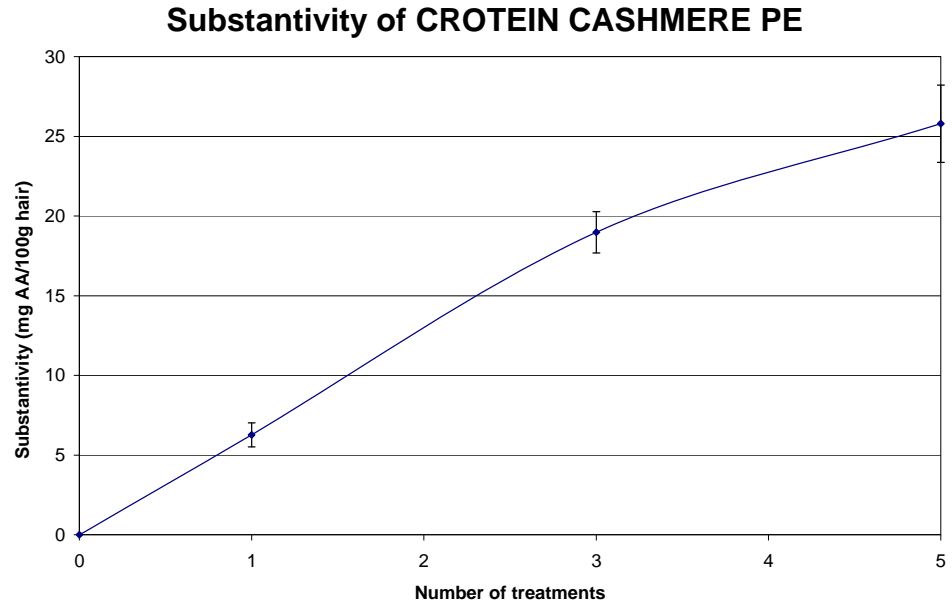


Figure 1: Effect of repeat shampoo treatments containing 1.0% active **CROTEIN CASHMERE PE**

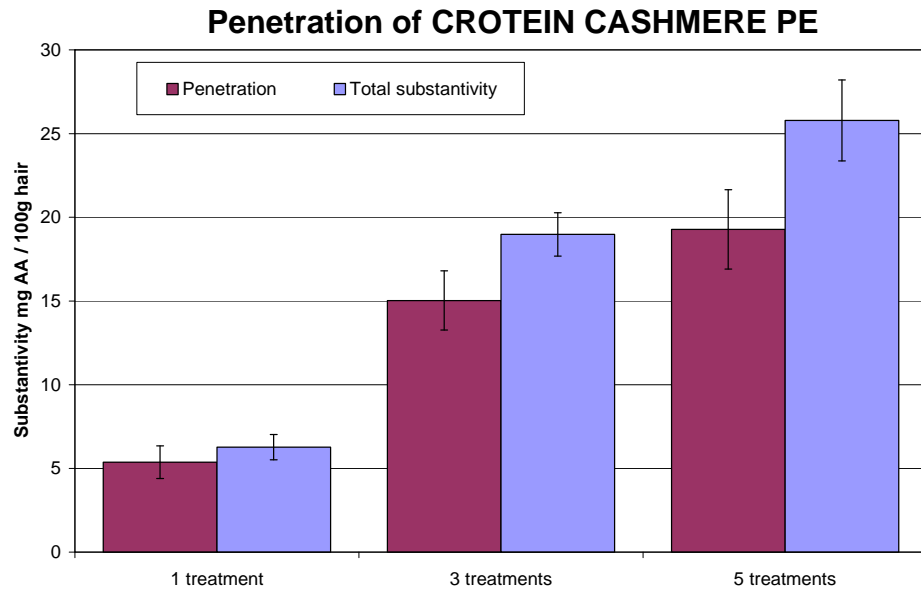


Figure 2: Penetration of 1.0% active **CROTEIN CASHMERE PE** from a shampoo base

CROTEIN CASHMERE PE

Conditioner Results

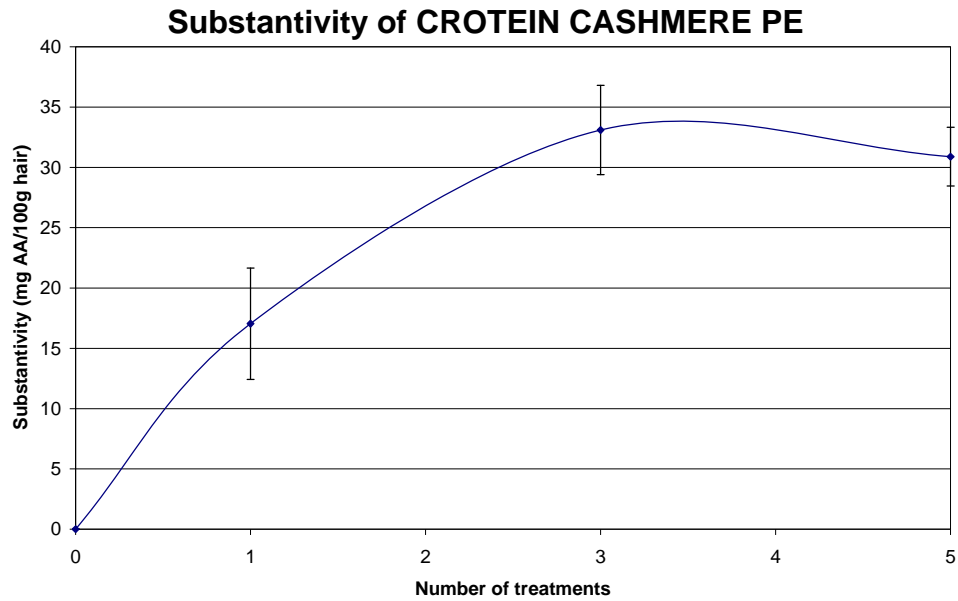


Figure 3: Effect of repeat conditioner treatments containing 1.0% active **CROTEIN CASHMERE PE**

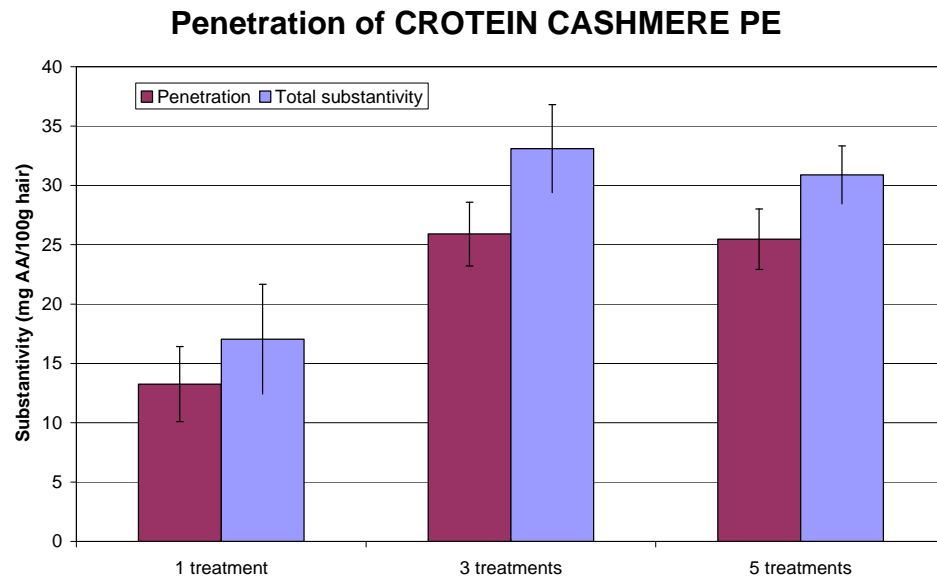


Figure 4: Penetration of 1.0% active **CROTEIN CASHMERE PE** from a conditioner base

**CROTEIN CASHMERE PE**

The results have clearly demonstrated the substantivity of **CROTEIN CASHMERE PE** to virgin brown hair from both shampoo and conditioner bases. Typically around 80% of the substantive **CROTEIN CASHMERE PE** was found to have penetrated the hair fiber. Greater substantivity was found from the conditioner rather than the shampoo, in line with similar previous studies.

Successive studies showed that the substantivity increased after three treatments, but had started to plateau out after 5 treatments, indicating that the product will not “build up” on the hair.

This study has demonstrated both substantivity and penetration of **CROTEIN CASHMERE PE** to normal brown hair from both shampoo and conditioner bases.

A copy of the test protocols and results of the substantivity studies conducted is available on request (document ref V189/0)

**Formulating**

Supplied as a 20% aqueous solution, **CROTEIN CASHMERE PE** is easily incorporated into a wide range of cosmetic systems. It is water soluble and soluble in aqueous/alcoholic systems up to 50% alcohol. It can be incorporated into cold mix systems and displays an excellent temperature tolerance. Typical usage levels are between 0.2 and 3%.

**Regulatory**

EINECS: 231-791-2 + 274-001-1  
CAS: 69430-36-0

**References**

- 1 R T Jones & S P Chahal, *The use of Radiolabeling Techniques to Measure Substantivity to and Penetration into Hair of Protein Hydrolysates*, IFSCC, Sydney, Australia (1996)