

(12) **UK Patent Application** (19) **GB** (11) **2 160 424A**

(43) Application published 24 Dec 1985

(21) Application No **8515904**

(22) Date of filing **24 Jun 1985**

(30) Priority data

(31) **85427** (32) **22 Jun 1984** (33) **LU**

(71) Applicant
**L'Oreal, (France),
14 rue Royale, 75008 Paris, France**

(72) Inventors
**Jean-Francois Grollier,
Chantal Fourcadier**

(74) Agent and/or address for service
**J. A. Kemp & Co., 14 South Square, Gray's Inn, London,
WC1R 5EU**

(51) INT CL⁴
A61K 7/06

(52) Domestic classification
**A5B FC
C5D 6B12P 6B13 6C8**

(56) Documents cited
**GB A 2104379 GB 1604473
GB A 2088209 FR 2403076
GB A 2005705**

(58) Field of search
A5B

(54) **Compositions for delaying the onset of a greasy appearance of the hair**

(57) Water-soluble polymers of the poly-beta-alanine type and compositions containing them are useful in delaying the onset of a greasy appearance to hair. A polyaspartic acid derivative can also be present in the composition.

GB 2 160 424 A

SPECIFICATION

New Cosmetic Compositions for Delaying the Onset of a Greasy Appearance of the Hair, and Use

The present invention relates to new cosmetic compositions for delaying the onset of a greasy appearance of the hair. These compositions contain at least one particular water-soluble polyamide.

5 The invention also relates to the use of this particular polyamide in the treatment of hair in order to delay the onset of the greasy appearance thereof. 5

In Belgian Patent 893,738, we describe the use of water-soluble polyamides of the poly-beta-alanine type in cosmetic compositions for the hair. These compositions enable the hair to be endowed with properties of shape-retention and body, which favour, in particular, the production of bouffant hairstyles.

10 While pursuing research into the use of these water-soluble polyamides, we discovered that some of them were also capable of delaying the onset of the greasy appearance of the hair. The onset of this greasy appearance, which is observed in a substantial proportion of individuals, is due to the well-known phenomenon of "regreasing", that is to say to the secretion of sebum by the sebaceous glands. For short, it is said that such individuals have "greasy" hair. 10

15 The present invention provides a cosmetic composition capable of delaying the onset of the greasy appearance of hair, which comprises in a suitable cosmetic vehicle, an effective amount of at least one water-soluble polymer of the poly-beta-alanine type. 15

It is appropriate to note that the compositions of the invention do not appear to act on the production of sebum, but act exclusively on the appearance of the hair, which assumes the so-called "greasy" appearance less quickly, despite the phenomenon of regreasing. 20

Preferably the water-soluble polyamide comprises from 50 to 100% of units of formula I:



and from 0 to 50% of units of formula II:



25 The water-soluble polyamides of the poly-beta-alanine type (hereinafter referred to, for short, as "poly-beta-alanines") are described in U.S. Patent 4,082,730 and in Belgian Patent 893,738, or can be obtained by methods similar to those described in these patents. 25

The water-soluble poly-beta-alanines which can be used in the compositions generally have a molecular weight which can vary from 500 to 200,000, preferably from 2,000 to 100,000 and more especially from 50,000 to 100,000. The molecular weight is that determined by the method of light scattering. 30

Furthermore, it has been noted that, when substantial regreasing occurs, it becomes necessary to use relatively large amounts, and consequently high concentrations, of poly-beta-alanine.

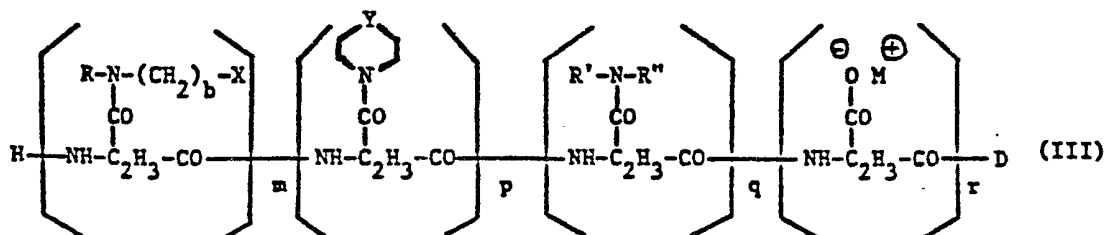
However, this increase in the dose applied, needed for obtaining the desired effect, brings about a deterioration in the other cosmetological properties of the product, especially on repeated application.

35 It has been observed that the repeated application of these compositions, containing high concentrations of polymer based on poly-beta-alanine, tended to leave on the hair a deposit which was perceptible to the touch. As a result of this, whilst the application of these high concentrations of poly-beta-alanine enables the onset of the greasy appearance of the hair to be delayed in the long term, it imparts a rather unattractive appearance to the hair style. 35

40 It has now been discovered that it is possible to obtain compositions which are capable of delaying the onset of the greasy appearance of the hair substantially without having the disadvantages mentioned above, provided that poly-beta-alanine is used in combination with certain other hair treatment agents, and especially with at least one derivative of polyaspartic acid, such as described in French Patent No. 77/27,769 (publication No. 2,403,076). 40

45 These polyaspartic acid derivatives have been previously proposed as adjuvants in hair-care compositions, since they improve the shape-retention of the hair. 45

The said polyaspartic acid derivatives correspond to a product of the formula III:



in which:

R is hydrogen or C₁—C₄ alkyl,

b is an integer of from 2 to 6,

X is —NR_I(R_{II})

- 5 or a group —N[⊕]R_I(R_{II})(R_{III})Z[⊖], in which R_I, R_{II} and R_{III}, which may be identical or different, are each hydrogen, C₁—C₁₈ alkyl or C₂—C₁₈ alkenyl, or alternatively R_I and R_{II}, together with the nitrogen atom to which they are attached, form a 6-membered ring which may contain another hetero atom which may be the same or different from the first, and Z[⊖] is an anion derived from an organic or inorganic acid; 5

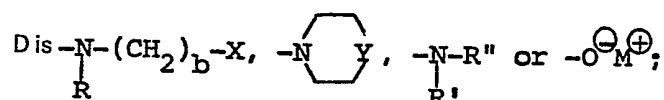
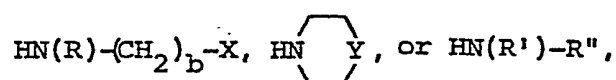
Y is oxygen, methylene or —N(R''')— or —N(R''')(R''''')—
[⊕]Z₁[⊖]

- 10 in which R''' and R''''', which may be identical or different, are each hydrogen, C₁—C₁₈ alkyl or C₂ to C₁₈ alkenyl and Z₁[⊖] is an anion derived from an organic or inorganic acid; 10

R' is hydrogen, C₁—C₄ hydroxyalkyl, C₁—C₄ hydroxyalkyloxyalkyl group, C₁—C₁₈ alkyl group or C₂—C₁₈ alkenyl;

R'' is hydrogen, C₁—C₄ hydroxyalkyl or C₁—C₄ alkyl;

- 15 M is hydrogen, alkali metal or half of an alkaline earth metal atom, or alternatively M[⊕] is an ammonium ion derived from an amine 15



- 20 m, p, q and r are each 0 or an integer such that the sum (m+p+q+r) is from 15 to 500, and m and p can only be zero simultaneously if either 20

a) q is other than zero and R' is hydroxyalkyl, or

b) q equals zero.

Preferred polyaspartic acid derivatives of formula III, are those in which:

- 25 a) m=p=0; 25

R'=H;

R''=—CH₂—CH₂—OH; and

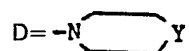
D=—O[⊖]M[⊕]; M[⊕] being the cation derived from monoethanolamine;

- 30 b) m=p=q=0; 30

D=—O[⊖]M[⊕];

- 30 M[⊕] denotes H[⊕], an alkali metal cation, or a cation derived from monoethanolamine or 2-amino-2-methyl-1-propanol; 30

c) m=q=r=0;



Y=—O—, —CH₂—, —N(CH₃)—

- 35 These polymers can be prepared, in particular, by processes similar to those described in French Patents 2,403,076 and 2,424,292. 35

In the compositions the content of polymer of the poly-beta-alanine type can generally vary from 0.1 to 5%, and especially from 0.5 to 2%, by weight relative to the total weight of the composition.

- 40 The content of polyaspartic acid derivative can vary from 0 to 5% by weight; generally, when it is present, its concentration varies from 0.1 to 5%, and especially from 0.2 to 2%, by weight relative to the total weight of the composition. 40

- 45 The vehicle present in the compositions is generally a conventional liquid vehicle capable of dissolving the active ingredient or ingredients used. An aqueous vehicle is preferably used, comprising water or a hydroalcoholic mixture, the alcohol preferably being an alkanol having 1 to 4 carbon atoms, and especially ethanol or isopropyl alcohol. 45

When the vehicle is a hydroalcoholic mixture, the alcohol is generally present in proportions of less than 55% by weight relative to the total weight of composition.

- 50 The compositions can contain, in addition, at least one of the common adjuvants such as perfumes, colouring agents, preservatives, pH-modifying agents, softening agents, sequestering agents, foam stabilising agents, ultraviolet-absorbing agents, peptising agents, or surfactants, for the purpose of putting them into a form appropriate for their use. These compositions are used as non-rinsed or rinsed products. 50

The invention also provides a cosmetic composition pack, comprising in a suitable package a composition as defined in any one of the preceding claims and directions containing instructions for using the composition for the purpose of delaying the onset of the greasy appearance of the hair.

These compositions take the form, in particular, of non-rinsed products such as lotions, styling foams, hair shaping lotions, hair setting lotions or brushing lotions, which are prepared by the usual methods.

They can also take the form of shampoos, lotions to be rinsed or treatment products which can be applied before or after dyeing or bleaching, before or after shampooing, and before or after permanent waving.

The pH of the compositions generally vary from 3 to 10.

These compositions can also be presented in the form of pressurised compositions for aerosols, sprays or foams, in combination with a propellant. By way of propellant, carbon dioxide, nitrogen, nitrous oxide, or volatile hydrocarbons such as butane, isobutane or propane, or preferably chlorinated and/or fluorinated hydrocarbons, are typically used.

The invention relates to the use of water-soluble polymers of the poly-beta-alanine type, as defined above, in the treatment of the hair for the purpose of delaying the onset of the greasy appearance thereof.

The invention also relates to the use, for this purpose, of a combination of a polymer of the poly-beta-alanine type and a cosmetic agent such as a polyaspartic acid derivative, especially a polyaspartic acid derivative corresponding to the formula III.

The invention relates to the use of polymers of the poly-beta-alanine type, optionally in combination with polyaspartic acid derivatives, in the form of compositions as defined above.


The process for treating the hair consists mainly in applying the composition defined above on the hair of an individual having greasy hair, in an amount sufficient to impregnate the latter.

The application is carried out, for example, immediately after washing the hair with a shampoo, or a short time after shampooing.

After impregnation of the hair, the latter can be dried directly (in the case of the non-rinsed compositions). Rinsing can also be carried out before drying the hair. It is of course possible to set the hair before drying.

The process for treating the hair can also comprise washing the hair with a shampoo containing the composition. It is then advisable, consequent on washing the hair by means of the said shampoo, to observe an exposure time of a few minutes before carrying out the rinsing.

The examples which follow illustrate the invention without, however, limiting it. In these examples, the parts and percentages are expressed by weight except where otherwise stated.

—*the compound A'* corresponds to the formula III, with $m=q=r=$ zero, $D=$  Y

and $Y=$ oxygen atom.

It is described in Example 1 of French Patent No. 2,403,076.

—*the compound B'* corresponds to the formula III, with $m=p=q=$ zero, and $M=Na$.

It is described in the article by Allen Vegotsky et al., J. of Am. Chem. Soc., 80, pp 3361—3366 (1958).

—*the compound C'* corresponds to the formula III, with $m=p=r=$ zero, and $Y=CH_2-$.

It is described in Example 11 of French Patent 2,403,076.

—*the compound D'* corresponds to the formula III, with $m=p=$ zero, $M^{\oplus}=$ ammonium ion derived from monoethanolamine, $R' =$ beta-hydroxyethyl and $R''=H$.

It is described in the article by Paolo Neri et al., J. Med. Chem., Vol. 16, No. 3, pp. 893—897 (1973).

—*the compound E'* corresponds to the formula III, with $m=p=q=0$, $M^{\oplus}=H^{\oplus}$

It is described in the article by K. Kovacs et al. J. Org. Chem. 26, pp 1084—1091 (1961).

EXAMPLE 1

A lotion of the following formula was prepared:

Poly-beta-alanine (M.W. 80,000) 1.0 g

Compound A' 2.0 g 45

Adjuvants (perfume, colouring, preservative) q.s.

Water q.s. 100 g

The pH is adjusted to 5.0 by adding lactic acid.

This composition is used in the following manner: after conventional shampooing, the hair is wrung and 8 to 20 cm³ of the lotion are then applied thereon, distributing it to impregnate the whole head of hair. The customary styling is then carried out.

EXAMPLE 2

A lotion of the following formula was prepared:

	Poly-beta-alanine (M.W. 80,000)	0.5 g	
	Compound B'	1.5 g	
5	Ethyl alcohol, 30% by volume	25.5 g	5
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

The pH is adjusted to 7.5 by adding 2-amino-2-methyl-1-propanol.

EXAMPLE 3

10 A lotion of the following formula was prepared: **10**

	Poly-beta-alanine (M.W. 80,000)	1.0 g	
	Compound B'	1.0 g	
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

15 The pH is adjusted to 6 by adding lactic acid. **15**

EXAMPLE 4

A lotion of the following formula was prepared:

	Poly-beta-alanine (M.W. 80,000)	1.0 g	
	Compound B'	1.5 g	
20	Adjuvants (perfume, colouring, preservative)	q.s.	20
	Water	q.s. 100 g	

The pH is adjusted to 6 by adding citric acid.

EXAMPLE 5

A lotion of the following formula was prepared:

25	Poly-beta-alanine (M.W. 80,000)	1.0 g	25
	Compound C'	0.5 g	
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

The pH is adjusted to 9 by adding 2-amino-2-methyl-1-propanol.

EXAMPLE 6

A composition in a pressurised container for an aerosol, of the following formula, was prepared:

	Poly-beta-alanine (M.W. 80,000)	1.5 g	
	Compound C'	1.0 g	
5	Nonionic surfactant obtained* by condensing 3.5 mol of glycidol with a C ₁₁ —C ₁₄ α-diol	0.1 g	5
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

*According to French Patent 71/17,206 (2,091,516).

10	The pH is adjusted to 5.5 by adding 2-amino-2-methyl-1-propanol. This composition is packaged in a pressurised container for an aerosol, with the following ingredients:		10
	—Above composition	85.0 g	
	—Chlorofluorocarbon propellants (C.F.C. 114/12; 50/50 by weight)	15.0 g	
15		100.0 g	15

EXAMPLE 7

A lotion of the following formula was prepared:

	Poly-beta-alanine (M.W. 80,000)	1.0 g	
	Compound D'	0.5 g	
20	Adjuvants (perfume, colouring, preservative)	q.s.	20
	Water	q.s. 100 g	

The pH is adjusted to 3 by adding lactic acid.

EXAMPLE 8

A lotion of the following formula was prepared:

25	Poly-beta-alanine (M.W. 80,000)	2.0 g	25
	Compound D'	1.0 g	
	20% strength ethanol	17.0 g	
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

30 The pH is adjusted to 5.3 by adding lactic acid. 30

EXAMPLE 9

A lotion of the following formula was prepared:

	Poly-beta-alanine (M.W. 80,000)	1.5 g	
	Compound E'	1.5 g	
35	Adjuvants (perfume, colouring, preservative)	q.s.	35
	Water	q.s. 100 g	

The pH is adjusted to 3.5 by adding citric acid.

EXAMPLE 10

A lotion of the following formula was prepared:

	Poly-beta-alanine (M.W. 80,000)	1.5 g	
	Compound E'	0.5 g	
5	20% strength ethanol	17.0 g	5
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

The pH is adjusted to 4.5 by adding 2-amino-2-methyl-1-propanol.

EXAMPLE 11

10 A lotion of the following formula was prepared: 10

	Poly-beta-alanine (M.W. 80,000)	0.5 g	
	Compound C'	0.5 g	
	Adjuvants (perfume, colouring, preservative)	q.s.	
	Water	q.s. 100 g	

15 The pH is adjusted to 5 by adding hydrochloric acid. 15

EXAMPLE 12

	Poly-beta-alanine (M.W. 80,000)	1.5 g	
	Perfume		
	Colouring		
20	Ethyl alcohol, q.s. 20% (by volume)		20
	Water	q.s. 100 g	

This non-rinsed lotion is applied on greasy hair after shampooing.

It endows hair with favourable cosmetic properties, and delays the return of a greasy appearance.

EXAMPLE 13

25 Shampoo: 25

	Poly-beta-alanine (M.W. 80,000)	3 g	
	Nonionic surfactant obtained by condensing 3.5 mol of glycidol with a C ₁₁ —C ₁₄ α-diol	0.1 g	
	Adjuvants (perfume, colouring, preservative)	q.s.	
30	Water	q.s.	30

EXAMPLE 14

After-Shampoo

	Poly-beta-alanine (M.W. 80,000)	2.5 g	
	Perfume,	q.s.	
35	Colouring,	q.s.	35
	Water	q.s. 100 g	

This after-shampoo delays the greasy appearance of hair.

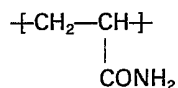
CLAIMS

1. A cosmetic composition capable of delaying the onset of the greasy appearance of hair, which comprises in a suitable cosmetic vehicle, an effective amount of at least one water-soluble polymer of the poly-beta-alanine type.

- 5 2. A composition according to Claim 1, in which the water-soluble polyamide comprises from 50 to 100% of units of formula I: 5

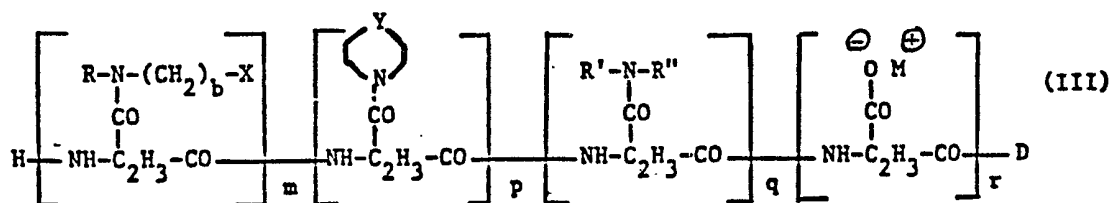


and from 0 to 50% of units of formula II:



- 10 3. A composition according to Claim 1 or 2 which also comprises at least one derivative of polyaspartic acid. 10

4. A composition according to Claim 3, in which the polyaspartic acid derivative is of formula III:



in which:

- 15 R is hydrogen or C₁-C₄ alkyl, 15
b is an integer of from 2 to 6,
X is -NR_I(R_{II})

- or -N[⊕]R_I(R_{II})(R_{III})Z[⊖], in which R_I, R_{II} and R_{III}, which may be identical or different, are each hydrogen, C₁-C₁₈ alkyl or C₂-C₁₈ alkenyl, or alternatively R_I and R_{II}, together with the nitrogen atom to which they are 20
attached, form a 6-membered ring which can contain another hetero atom which may be the same or 20
different from the first, and Z[⊖] is an anion derived from an organic or inorganic acid;


Y is oxygen, methylene or -N(R''')- or -N(R''')(R'''')-
⊕Z₁[⊖]

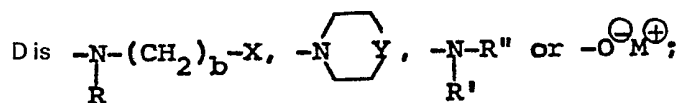
in which R''' and R''', which may be identical or different, are each hydrogen, C₁-C₁₈ alkyl or C₂ to C₁₈ alkenyl and Z₁[⊖] is an anion derived from an organic or inorganic acid;

- 25 R' is hydrogen, C₁-C₄ hydroxyalkyl, C₁-C₄ hydroxyalkyloxyalkyl group, C₁-C₁₈ alkyl group or C₂-C₁₈ 25
alkenyl;

R'' is hydrogen, C₁-C₄ hydroxyalkyl or C₁-C₄ alkyl;

M is hydrogen, alkali metal or half of an alkaline earth metal atom, or alternatively M[⊕] is an ammonium ion derived from an amine

- 30 HN(R)-(CH₂)_b-X, HN , or HN(R')-R'', 30



m, p, q and r are each 0 or an integer such that the sum (m+p+q+r) is from 15 to 500, and m and p can only be zero simultaneously if either

- 35 a) q is other than zero and R' is hydroxyalkyl, or 35
b) q equals zero.

5. A composition according to Claim 3 or 4, in which the polyaspartic acid derivative comprises from 0.1 to 5% by weight relative to the total weight of the composition.

6. A composition according to Claim 5, in which the polyaspartic acid derivative comprises from 0.2 to 2% by weight.

- 40 7. A composition according to any one of the preceding claims, in which the polymer of the poly-beta-alanine type comprises from 0.1 to 5% by weight relative to the total weight of the composition. 40

8. A composition according to Claim 7, in which the polymer of the poly-beta-alanine type comprises from 0.5 to 2% by weight.

9. A composition according to Claim 1 substantially as described in any one of Examples 1 to 14.
10. A cosmetic composition pack, comprising in a suitable package a composition as defined in any one of the preceding claims, and directions containing instructions for using the composition for the purpose of delaying the onset of the greasy appearance of the hair.
- 5 11. A pack according to Claim 10, in which the composition is in the form of a non-rinsed or rinsed lotion, styling foam, hair shaping lotion, hair setting lotion, shampoo or brushing lotion, or of a treatment product to be applied before or after dyeing or bleaching, before or after shampooing, or before or after permanent waving. 5
12. A pack according to Claim 10, in which the composition is in the form of a pressurised composition for an aerosol, spray or foam, in combination with a propellant. 10
13. Use of a water-soluble polymer of the poly-beta-alanine type to delay the onset of the greasy appearance of the hair. 10
14. Use according to Claim 13, in which the said polymer of the poly-beta-alanine type is as defined in Claim 2.
- 15 15. Use according to Claim 13 or 14, in which the said polymer of the poly-beta-alanine type is combined with a polyaspartic acid derivative. 15
16. Use according to Claim 15, characterised in that the said polyaspartic acid derivative is as defined in Claim 4.
- 20 17. Use according to Claim 12 or 15, in which the water-soluble polymer is used in the form of a composition as defined in any one of Claims 1 to 9 or pack as defined in any one of claims 10 to 12. 20
18. A process for delaying the greasy appearance of hair in which an effective amount of a composition as defined in any one of Claims 1 to 9 is applied on the hair of an individual having greasy hair.