1370236

PATENT SPECIFICATION

(11) 1370236

(19)

(21) Application No. 1236/72 (22) Filed 11 Jan. 1972
(23) Complete Specification filed 9 Jan. 1973
(44) Complete Specification published 16 Oct. 1974
(51) International Classification A61K 7/00
(52) Index at acceptance A5B 771
(72) Inventors GIRISH PRASAD MATHUR
KURUVAKKAT KOCHU GOVINDMENON and
SRINIVASAN VARADA RAJAN

(54) SKIN COMPOSITION

(71) We, UNILEVER LIMITED, a company organised under the laws of Great Britain, of Unilever House, Blackfriars, London, E.C.4., England, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to skin cosmetic preparations which have a lightening effect on the skin.

Hitherto, skin preparations have been concerned with maintaining the colour of the skin against exposure to ultra-violet light and have been based upon materials which deflect and scatter incident ultra-violet light of the wavelength which produces burning and tanning, or which absorb this light.

The colour of normal human skin is due to the presence of melanin, haemoglobin and carotenoids. Of these pigments, melanin is of prime importance in considerations of skin pigmentation and cosmetology.

Melanin occurs in the form of fine dark brownish granules and is synthesised by melanocytes which are specialised cells of the basal layer of epidermis and are characterised by the presence of tyrosinase; this enzyme is responsible for the aerobic oxidation of l-tyrosine to dopa and to dopa quinone, which in turn is converted to indole - 5,6 - quinone. This monomer is then oxidised and polymerised to form a large polymer which is believed to be attached, through its quinone linkages, to the amino or sulphydryl groups of the protein matrix of the pigment granules.

Whereas the melanocytes are the sole producers of melanin in the skin, the malpighian cells are responsible for the distribution and dispersion into the epidermis of the melanin granules.

We have now discovered that the skin can be lightened by topical application of niacin and we believe that this is achieved by reducing the effective concentration of cyclic adenylic acid (cyclic 3′-5′-AMP) which in turn mediates the action of various hormones including the melanocyte stimulating hormone involved in the dispersion of melanin. Cyclic 3′-5′ nucleotide phosphodiesterase is an enzyme which degrades cyclic adenylic acid to adenosine - 5′ - monophosphate; we have noted that the activity of this enzyme can be stimulated by niacin. Hence niacin appears to reduce the effective concentration of cyclic 3′-5′ AMP and thereby inhibits the dispersion of melanin granules.

Accordingly, the present invention provides a skin lightening composition comprising from 0.5 to 10% by weight of niacin in a physiologically acceptable carrier.

Niacin is, of course, known by other names such as nicotinic acid or pyridine β-carboxylic acid, and has been used in dietary treatments. It is included in the skin cosmetic preparations of the invention is amounts of from 0.5 to 10%, preferably 1 to 5% by weight of the preparation. Suitable carriers are the conventional formulations in the cream, lotion and aerosol art.

Having considered the skin lightening effect that niacin can have, it will be appreciated that skin darkening induced by exposure to sunlight, and normally manifest as suburn or suntan, can at least partially reverse this effect.

The increase of melanin pigment that follows exposure of skin to solar radiation or ultra-violet light from artificial sources involves two distinct photobiological processes:

(i) immediate pigment darkening of preformed pigment without induction of erythema, and
(ii) the primary melanisation involving induction of erythema, formation of new pigment and its dispersion.

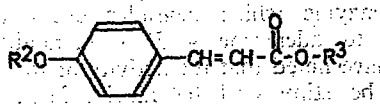
The wavelengths which lie in the range of 320—420 mμ with a broad maximum at 420 mμ are responsible for the immediate pigment darkening in skin of preformed pig-

ment without induction erythema. Primary melanisation is most effectively initiated by wavelengths between 290 and 320 mμ, with peaks at 297 or 300—307 mμ.

We have shown that it is possible to prepare a skin lightening composition which also provides protection from the immediate pigment darkening and from the primary melanisation.

Accordingly, a second aspect of the present invention provides a skin lightening composition comprising up to 10% by weight of niacin and an ultra-violet absorber absorbing in the range of 290—360 mμ.

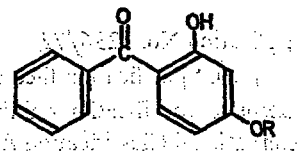
The ultra-violet absorber which absorbs in the range 290—320 mμ is preferably urocanic acid and/or a compound of the formula



(a)

wherein R^2 is alkyl containing from 1 to 4 carbon atoms, preferably CH_3, and R^3 can be alkyl containing from 4 to 10 carbon atoms, preferably C_6H_{13} or an alkoxyalkyl group of the type $—R^4—O—R^5$, wherein R^4 is alkylene containing from 1 to 4 carbon atoms and R^5 is alkyl containing from 1 to 4 carbon atoms.

To endow the compositions with tanning prevention properties, a compound having maximum absorption in the tanning ray region of the spectrum, viz, 300—360 mμ may be used. Example of such compounds have the general formula



(b)

wherein R is alkyl containing from 4 to 12 carbon atoms, preferably C_8H_{17}.

These general classes of ultra-violet absorber will now be referred to as "u.v. absorbers (a)" and "(b)" respectively.

Of the foregoing examples, the preferred ultraviolet absorbers are selected from urocaic acid alone, and Givtan F (commercially available from Givaudin). For compositions having tanning prevention properties also, Cyasorb 531 ('CYASORB' is a trade mark and Cyasorb 531 is commercially available from the American Cyanamid Company) is the preferred ultra-violet absorber (b) to be used in association with niacin and a ultra-violet absorber (a).

The advantage of using niacin in association with a ultra-violet absorber in each of the ranges 290—320 mμ and 320—360 mμ is that the resultant skin preparation not only lightens the skin, but protects it from both burning rays and tanning rays.

Appropriate amounts of ulta-violet absorber (a) are from 0.1% to 4% by weight of composition and of ultra-violet absorber (b) 0.1 to 4% by weight of composition, and when urocanic acid is used, the latter may be present in 0.1% to 10% by weight of the composition.

The present invention will be further described by way of the following Examples of cosmetic creams:

	Example 1 % by weight	Example 2 % by weight	Example 3 % by weight
Mineral oil	3.00	—	3.00
Glycerol monostearate	3.00	—	3.00
Nipagin	0.10	0.05	0.10
Stearic acid	10.00	24.00	10.00
Disodium orthophosphate	0.70	—	0.70
Citric acid	0.04	—	0.04
Sodium hydroxide	0.46	0.20	0.46
Triethanolamine	—	1.00	—
Urocanic acid	0.50	0.05	0.05
Niacin	1.00	1.00	1.00
Givtan F	—	2.00	2.00
Cyasorb UV531	—	2.00	2.00
Polyethylene glycol	5.00	—	5.00
Isopropyl myristate	—	4.00	—
Glycerol	—	7.50	—
Water	to 100	to 100	to 100

These compositions had a satisfactory skin lightening effect.

'Nipagin' is a trade mark.

In Abelson D et al, Biochemical Journal (1965) *96* 840, simple solutions of nicotinic acid (also known as niacin) in water or alcohol are disclosed for the purpose of studying spectral and biological changes induced by

ultra-violet light. Simple solutions of nicotinic acid such as these are hereby disclaimed.

Subject to the foregoing disclaimer,
WHAT WE CLAIM IS:—

1. A skin lightening composition comprising from 0.5 to 10% by weight of niacin in a physiologically acceptable carrier.

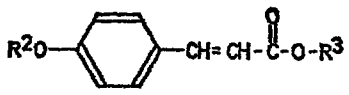
2. A composition according to claim 1, comprising from 1 to 5% by weight of niacin.

3. A composition according to claim 1 or 2, comprising up to 10% by weight of an ultra-violet absorber absorbing in the range 290—360 mμ.

4. A composition according to claim 3, in which the ultra-violet absorber is a compound absorbing in the range 290—320 mμ.

5. A composition according to claim 4, in which the compound is urocanic acid.

6. A composition according to claim 4, in which the compound is represented by the formula:

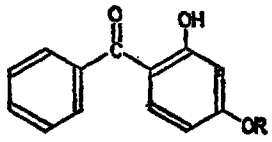


wherein R^2 is alkyl having 1—4 carbon atoms, R^3 is alkyl having 4—10 carbon atoms, or an alkoxyalkyl group of the type $—R^4—O—R^5$, wherein R^4 is alkylene having 1—4 carbon atoms and R^5 is alkyl having 1—4 carbon atoms.

7. A composition according to claim 3, 4 or 5, in which the ultra-violet absorber forms 0.1—4% by weight of the composition.

8. A composition according to claim 3, in which the ultra-violet absorber is a compound absorbing in the range 320—360 mμ.

9. A composition according to claim 8, in which the compound is represented by the formula



where R is an alkyl group containing from 4 to 12 carbon atoms.

10. A composition according to claim 9, in which the alkyl group is C_8H_{17}.

11. A composition according to claim 9 or 10, in which the ultra-violet absorber forms from 0.1 to 4% by weight of the composition.

12. A skin lightening composition comprising niacin in a cosmetically and physiologically acceptable carrier according to any one of the preceding claims and substantially as described in any one of the Examples.

13. A method of lightening the skin which comprises applying to the skin a composition according to any one of the preceding claims.

R. H. DOUCY,
Chartered Patent Agent.

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1974.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

ultra-violet light. Simple solutions of nicotinic acid such as these are hereby disclaimed.

Subject to the foregoing disclaimer,
WHAT WE CLAIM IS:—

1. A skin lightening composition comprising from 0.5 to 10% by weight of niacin in a physiologically acceptable carrier.

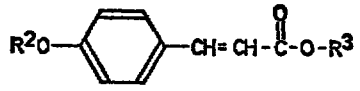
2. A composition according to claim 1, comprising from 1 to 5% by weight of niacin.

3. A composition according to claim 1 or 2, comprising up to 10% by weight of an ultra-violet absorber absorbing in the range 290—360 mμ.

4. A composition according to claim 3, in which the ultra-violet absorber is a compound absorbing in the range 290—320 mμ.

5. A composition according to claim 4, in which the compound is urocanic acid.

6. A composition according to claim 4, in which the compound is represented by the formula:

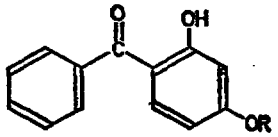


wherein R^2 is alkyl having 1—4 carbon atoms, R^3 is alkyl having 4—10 carbon atoms, or an alkoxyalkyl group of the type $—R^4—O—R^5$, wherein R^4 is alkylene having 1—4 carbon atoms and R^5 is alkyl having 1—4 carbon atoms.

7. A composition according to claim 3, 4 or 5, in which the ultra-violet absorber forms 0.1—4% by weight of the composition.

8. A composition according to claim 3, in which the ultra-violet absorber is a compound absorbing in the range 320—360 mμ.

9. A composition according to claim 8, in which the compound is represented by the formula



where R is an alkyl group containing from 4 to 12 carbon atoms.

10. A composition according to claim 9, in which the alkyl group is C_8H_{17}.

11. A composition according to claim 9 or 10, in which the ultra-violet absorber forms from 0.1 to 4% by weight of the composition.

12. A skin lightening composition comprising niacin in a cosmetically and physiologically acceptable carrier according to any one of the preceding claims and substantially as described in any one of the Examples.

13. A method of lightening the skin which comprises applying to the skin a composition according to any one of the preceding claims.

R. H. DOUCY,
Chartered Patent Agent.

Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1974.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

* C L M S *