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LANOLIN OR LANOLIDE?

Lanochemistry

Lanochemistry is a technological sector of primary and persistent cosmetic and dermatopharmaceutical interest. It is based on sheep wool fat and provides scores of lanolin derivatives after suitable purification, fractionating, extraction, hydrolysis, hydrogenation, ethoxylation, acetylation, propoxylation, etc., for a wide range of topical preparations.

Lanolin

Lanolin remains, however, of basic interest as a raw material. Unfortunately, this natural compound, according to the literature, is never inconvenience-free, has of late given rise to new problems because of its exposure to environmental pollution caused by the world wide spreading of pesticides, antivermins, fungicides and herbicides. These are substances that sheep are daily in contact with and that cause permanent contamination of their wool and subsequently of the lanolin derived from it.

Reconstituted lanolin bases

The need for lanolin to be 100% free from chemical pollutants which would be harmful to the skin even in slight quantities, has led the lanolin industry itself to look for, design and produce alternative reconstituted lanolin bases. The same properties must be as close as possible to the complex natural mixture but with no impurities and hence with no toxic, irritative or sensitizing effect. This research has led to a wide range of lanolin substitutes which, however, do not always have the same properties as the natural product.

Lanolide

Vevy Europe, thanks to its longstanding experience in basic and applied research on wool fats and their derivatives (for which it has been granting international know-how licenses since as far back as 1960) has been engaged in the development and large scale production in its own plants of a substance called Lanolide, since 1980. As far as practical application purposes are con-

cerned, Lanolide is identical and probably better than the best lanolin. Over the decades Lanolide has gained a strong foothold among most of the



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important European users. What are the characteristics that the formulating engineer requires for lanolin? First of all the typical binding and water absorption capacity which derive from the peculiar "plasticizing" action of lanolin. As compared with lanolin, Lanolide is not sensitive to oxidative processes. Lanolide is a compact, ivory

International information on dermo-pharmaceutics cosmetics and toiletries

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colored mass, more thready than lanolin and, in particular, having only a very mild smell. These features are of paramount importance for good quality and acceptability (even from an olfactory standpoint) of the finished product.

A great deal of attention has been paid to safety and hence to the pharmacotoxicologic, dermopharmacologic and clinical testing of Lanolide.

Lanolin/Lanolide Interchangeability

As for hydrophilia, Lanolide is perfectly interchangeable with lanolin and can therefore be used in the same application sectors. There can be no doubt about the fact that Lanolide, besides solving the problem related to pesticides in lanolin, also eliminates the risk of skin sensitization often caused by lanolin and its derivatives, as exhaustively described in the reference literature.

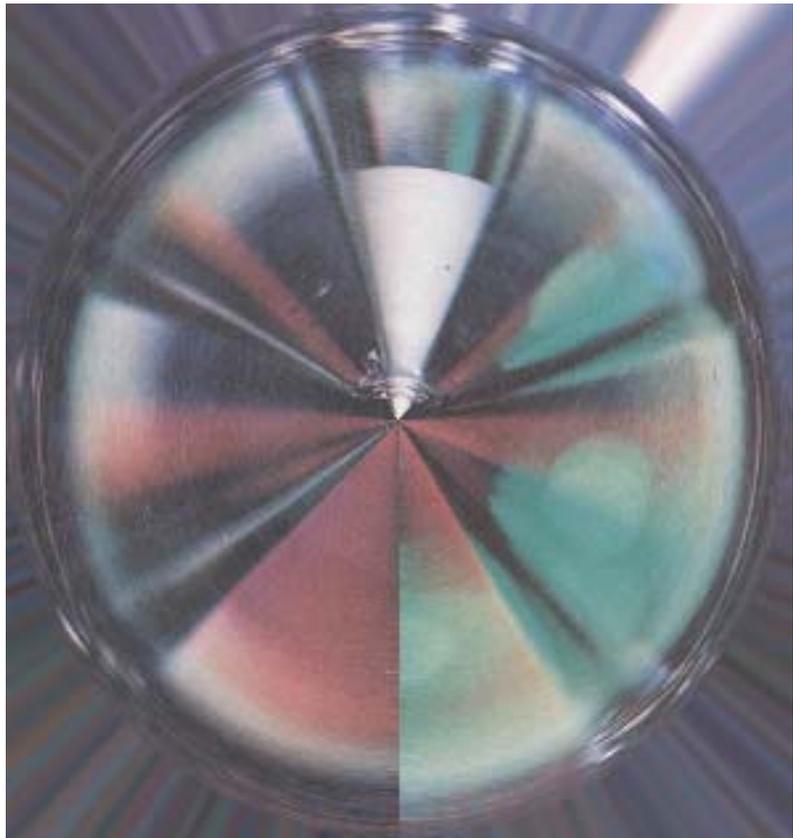
↳ Lanolina o Lanolide?

La lanochimica

La lanochimica costituisce un settore tecnologico di primario e persistente interesse cosmetico e dermofarmaceutico. Partendo dalla cera da lana di ovino, attraverso vari processi di purificazione, frazionamento, estrazione, idrolisi, idrogenazione, etossilazione, acetilazione, propossilazione ecc., si giunge alla disponibilità di decine di lanolina-derivati che trovano le più diverse applicazioni nelle preparazioni topiche.

La lanolina

La lanolina è una materia prima di basilare interesse. Purtroppo questa miscela naturale, che secondo la letteratura non è mai stata scevra di inconvenienti, è esposta ad inquinamenti ambientali connessi con la diffusione, a livello mondiale, di pesticidi, antiparassitari, anticrittogamici, diserbanti: sostanze con cui gli ovini si trovano quotidianamente a contatto e che finiscono per inquinare stabilmente la lana e la lanolina



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che da essa viene ricavata.

Basi lanoliniche ricostituite

L'esigenza di disporre di lanolina del tutto esente da inquinanti chimici, rischiosi per la pelle anche a piccole dosi, ha indotto l'industria, la stessa industria tradizionalmente produttrice di lanolina, a progettare e quindi ad offrire in alternativa basi lanoliniche ricostituite, aventi proprietà applicative il più vicino possibile a quelle della complessa miscela naturale ma esenti da impurezze e per conseguenza priva di effetti tossici, irritativi o sensibilizzanti. È così nata una estesa serie di basi sostitutive della lanolina, che però non sono riuscite a possedere gli stessi requisiti del prodotto naturale.

Lanolide

Vevy Europe - forte della sua esperienza nella ricerca di base ed applicata sui grassi di lana e derivati, esperienza che ha portato anche a cessioni internazionali di propri *know how* fin dal 1960 - è giunta ai primi del 1980 alla messa a punto ed alla produzione in proprio, su scala industriale, della Lanolide, che all'uso pratico si è rivelata identica se non migliore della migliore lanolina: nel corso di questi decenni la Lanolide si è confermata tale presso i più importanti utilizzatori europei. Quali sono le caratteristiche che il tecnico formulatore ricerca nella lanolina? Sono quella della sua tipica capacità legante e idroassorbente, connesse con un effetto plastificante del tutto caratteristico

Lanolide main features:

- constant and odourless composition;
- free from pesticides, heavy metals and allergens;
- not sensitive to oxidative processes;
- white, stable and odourless emulsions;
- complete dossier for safety assessment;
- perfectly interchangeable with lanolin in the same application sectors.

della lanolina. La Lanolide rispetto alla lanolina, non è sensibile a processi ossidativi. Organoletticamente la Lanolide è una massa compatta di color avorio chiaro, più filamentosa della lanolina e, soprattutto, assai po-

OINTMENTS, LIPOGELS AND ANHYDROUS LIPIDIC STICKS

Lanolide can be used in 5% to 50% in combination with conventional lipids used for these chemico-physical forms.

W/O EMULSIONS

Lanolide can be used together with primary emulsifiers as well as with the lipid constituent of emulsions having an external fat phase (dispersion medium). Average doses are ranging around 10%.

O/W EMULSIONS

Lanolide can be used as a contrast emulsifier and as a hydrophilic lipid constituent in emulsions having a watery dispersion medium at an average dose of about 5%.

SOAPS AND SOLID NON-SOAPS

Lanolide has a useful application as superfatting agent in soaps and syndets. Optimum doses range between 1% and 2.5%.

POWDERS

1%-2% **Lanolide** atomized in liquid state on pyrogenic silica may be admixed in talcum and other dusting powders having a lubricating, emollient and protectin action.

co odorosa. Sono particolari, questi, che assumono primaria importanza ai fini della buona qualità ed accettazione del prodotto finito. Primaria importanza è stata data alla sicurezza e quindi ai controlli farmacotossicologici e dermofarmacologici sperimentali e clinici della Lanolide.

Interscambiabilità lanolina-Lanolide

Per quel che riguarda l'idrofilia ed il comportamento emulsilogico, il prodotto è perfettamente interscambiabile con la lanolina e trova quindi applicazione negli stessi campi. Senza dubbio, l'impiego della Lanolide, oltre al risolvere il problema connesso all'inquinamento da pesticidi della lanolina, non comporta i rischi di sensibilizzazione cutanea da ascrivere sia a quest'ultima sia ai suoi derivati, ampiamente descritti da molti anni nella letteratura mondiale.

SCC 2005

Annual Technology Showcase

December 8, 2005

New York Hilton Hotel

New York City

Vevy Europe will present:

Lanolide

Safe and effective lipids for new mineral oil- and lanolin-FREE formulations

Oils, waxes and their derivatives constitute a very large and important class of basic cosmetic and pharmaceutical raw materials. They are used mainly as vehicles and emollients for a very wide range of creams, lotions, ointments, lipidic gels, oils, pastes and soaps. Lanolin, mineral oil, petrolatum and isopropyl esters are the raw materials most often found in topical ointments and emulsions. As it has been largely demonstrated in the past years all these lipidic components present not neglectable drawbacks which suggest their total or partial substitution with safer raw materials having the same effectiveness. Vevy Europe will present the results of research studies regarding the formulation of "alternative" ointments, absorption bases and emulsions containing no mineral oil, petrolatum, lanolin and IPM or IPP, but safe and effective raw materials for dermatological and cosmetic application. Here follows a brief review on the properties but also the inconveniences of the traditional substances found in topical products. Lanolin has been one of the most extensively used ingredi-

ents in topical preparations throughout the centuries. Indeed the use of lanolin was known to the ancient Greek since 700 B.C. It is the lipidic secretion of the sebaceous glands of the sheep and chemically it is a complex mixture of esters, diesters and hydroxyesters of high MW, lanolin alcohols and acids. Lanolin is an effective emollient. It softens and improves dry skin by retarding TEWL with a milder occlusive effect compared to petrolatum. However, apart from the pesticides content issue, the incidence of allergy and sensitization to lanolin and its derivatives has been reported in several papers. Nevertheless we should quote Maibach for the best conclusion on the matter "It is folly to state that lanolin allergy doesn't exist; nor it is proper to consider it very common. It is common enough to justify significant work to minimize it". Petrolatum, also known as petroleum jelly or vaseline, is a purified yellowish to light amber or white complex mixture of semisolid hydrocarbons, chiefly of the methane series having carbon numbers predominantly greater than C25. Actually petro-

Lanolide the superior homologous of lanolin

latum is a colloid system of non straight chain saturated crystalline hydrocarbons and high-boiling liquid hydrocarbons. White mineral oils are viscous liquid derived also from petroleum. They are complex mixtures of saturated hydrocarbons, having carbon numbers in the range of C15 to C50. The chemical and physical properties of white mineral oils are defined by a number of national and international standard setting groups dealing with food, pharmaceutical and cosmetic specifications. Petrolatum and white mineral oils have been used in topical preparations since the beginning of this century. They are excellent moisturizers and emollients and found very quickly markets in cosmetics and pharmaceuticals, e.g. baby oils, sunscreens and suntan oils, emollient creams and lotions, bath oils, lipsticks, make-up, make-up removers, hair care formulations, etc. In pharmaceuticals petrolatum and white oils provide a convenient anhydrous base for topical products, while the higher viscosity white oils are also used as laxatives. In February 1989 the U.K. Ministry of Agriculture, Fisheries and Food recommended a ban on almost all direct food applications of mineral hydrocarbons including white mineral oil. This decision was based, in part on the results of two 90-day toxicity studies in rats conducted using white oils. These studies demonstrated accumulation of oil in the mesenteric lymph nodes and liver, accompanied by microgranuloma formation at the highest dose levels. However other animal studies have not shown such effects and there has been no indication that absorption of white mineral oil has had any adverse effect on humans despite many years of use in pharmaceuticals, food and cosmetics. Later we shall discuss more data on mineral oil and petrolatum safety, remembering Butcher's studies showing acanthosis and parakeratosis (hypertrophy of the stratum corneum with imperfect maturation and differentiation of keratinocytes) following repeated application of mineral oil. Isopropyl esters are used to produce a light, non-greasy, emollient skin feel. Results presented by Lanzet show that all isopropyl esters, but mainly myristate, linoleate and lanolate, are comedogenic.

Side effects due to traditional lipids

Some drawbacks have already been introduced, while now we'll survey different researches performed by various investigators. According to Lanzet, only lanolin derivatives which contain the acid fraction (e.g. lanolic acid, isopropyl lanolate, acetylated lanolin alcohol, hydrogenated lanolin) are comedogenic. Recently Fulton surveyed, using the rabbit ear, the comedogenicity and irritancy of several skin care raw materials. Comedogenicity, or ability of test substance

to produce follicular hyperkeratosis, and irritancy, or ability of test substance to produce surface epithelial irritation, were evaluated on a scale of 0 to 5, being 5 the worst grade. Several lanolin derivatives are both comedogenic and irritating, sometimes due to other additives. Many esters, and especially isopropyl esters scored high comedogenicity and irritancy numbers. Mineral oil, but also several plant oils, gave a moderate to extensive increase in follicular keratosis. Several examples of side effects due to vehicle constituents are reported by Nater and De Groot. The estimated frequency of sensitization for contact allergy is considered rare for IPM and petrolatum, uncommon for lanolin and sesame oil. Conversely Maibach reported on chronic dermatitis and hyperpigmentation from petrolatum, while lipogranuloma and myospherulosis from petrolatum were discussed by Dunlap et al. Following an assay on the rabbit ear, Kligman et al. suggested that some compound for topical use, including IPM, lanolin, olive oil, peanut oil, cocoa butter and sesame oil, had acneogenic properties. Contact allergy to lanolin contained in face cosmetics is reported by Cronin and by Schorr. Fischer reported on contact allergy to IPM in feminine hygiene cosmetics.

Alternative raw materials

To overcome traditional formulation and the side effects connected to the substances reported above, to improve anhydrous cosmetics appearance, skin feel, stability, etc. we have performed several formulation studies substituting petroleum derivatives, lanolin, isopropyl esters and also vegetable oils with suitable Vevy Europe raw materials. We also replaced natural vegetable oils because they may develop rancidity and malodour due to their content in unsaturated fatty acids. Nesatol (Vevy codex 03.0197) is a reconstituted vegetable-based oil containing saturated fatty acids resistant to oxidation, having good solubilizing properties, imparting a soft feel and having a low skin irritation potential. Moreover some authors found that capric/caprylic triglyceride, peach kernel oil, sweet almond oil, grape seed oil, etc. exhibit comedogenic effects. PME (Vevy codex 03.0775), and also newer PME-1 (Vevy codex 03.3392) are non occlusive substitute for petrolatum; Syntesqual (Vevy codex 03.1133) substitutes mineral oil; Lanolide (Vevy codex 02.0911) replaces lanolin; Isostearene (Vevy codex 03.0373) replaces IPM, Lipocerite (Vevy codex 03.0465) and Cetacene (Vevy codex 03.1350) replace vegetable butters.

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