In preparing samples of this preparation for examination, we used the same quantity of citric acid employed in our preparation, *i. e.*, 0.2%. The finished preparation remained practically colorless for about one hour after manufacture, at which time a pronounced green color began to develop. The appearance of the green color, which became progressively intense, was taken as evidence of an increasing amount of ferric iron in the preparation. The preparation, examined colorimetrically at intervals revealed that the amount of ferric iron increased until precipitation occurred. When exposed to ordinary daylight with about two hours of direct sunlight per day on intermittent days when the sun shone, the preparation became colorless after a short time. With the passing of daylight, the green color recurred with greater intensity than was the case before the period of exposure. This continued until after an average of about eighteen days when the preparation turned purple, appeared colloidal upon examination, and gave the tyndal cone effect with transverse light. Twenty-four hours later a precipitate of what appeared to be ferric hydroxide began to form and continued until a large portion of the iron salt was precipitated.

Other preparations examined behaved in similar manner. All showed decomposition after varying periods of exposure to actinic light, air, cold or heat, a combination of the four agents or any two or three of them.

CONCLUSIONS

Using a simple approach, we have developed a formula for an elixir of ferrous sulfate which appears to us to be permanently stable. This preparation appears, likewise, to have all the desirable features of such an iron preparation with but few of the undesirable features. It incorporates a form of iron which, clinically, meets all the requirements necessary in treating the typical iron deficiency anemias but having the undesirable feature of possible gastro intestinal upset—a characteristic of all iron preparations commercially available today. Chemically, it meets all the requirements needed to insure its stability. We have found a minimum amount of ferric ion present after manufacture and the quantity does not increase perceptibly after long periods of storage. It is appealing to the esthetic senses. Thus, pharmaceutically, it is, in our estimation, near perfection.

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Hydrogenated Castor Oil as an Ointment Base

V. Jellified Ointments*

By George W. Fiero†

For certain types of ointments, an occlusive ointment base is desired. The most commonly employed occlusive ointment base is petrolatum. Unfortunately, this base has been used to a large extent without regard to its occlusive properties largely because of the fact that it is stable and has the proper consistency. For certain purposes, a liquefying gelatinized ointment base would be desirable.

In a previous paper (1), the writer discussed the properties of salts of hydroxystearic acid obtained from completely hydrogenated castor oil. This fatty acid has been found to have the peculiar property of producing solid gels when dissolved in oils, either liquid petrolatum or fixed oils, and hydrocarbons such as petroleum distillates, oil of turpentine, etc. By varying the amount of the acid, the consistency of the gel may be governed, and gelatinized ointments of various types may be obtained.

Cosmetic products prepared with liquid petrolatum and hydroxystearic acid possess desirable qualities of softness whether emulsified or non-emulsified, liquid or solid. Thus cold creams containing hydroxystearic acid have a soft jelly-like consistency which is highly desirable.

Liquefying creams can be obtained by

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substituting the hydroxystearic acid for part or all of the wax or other solidifier. Brilliantines can be prepared from these jellied oils.

EXPERIMENTAL

The hydroxystearic acid[1] was obtained by saponification of practically completely hydrogenated castor oil. It was found to have the following characteristics:

Acid value	185.9 mg. KOH
Molecular equivalent	299.5
Molecular weight of hydroxystearic acid	300.28

Because of its high melting point it was found more satisfactory to prepare a stock solution consisting of one part of the acid with four parts of heavy liquid petrolatum. This could be readily melted and diluted with liquid petrolatum when desired.

The heavy liquid petrolatum (white mineral oil) had the following specifications:

Specific gravity	0.875–0.885
Color	30 upward
Viscosity at 100° F. (Saybolt)	200–210
Flash point	360° F.

Consistency.—Since the consistency of the jellified liquid petrolatum varies with the content of hydroxystearic acid, various concentrations were prepared and the consistency was determined. The relative consistency was determined by the penetration method described in a previous paper (2). This consists of measuring the penetration in millimeters of a 1.6 cm. disc into the ointment in sixty seconds with varying added weights. White mineral oils[2] of different viscosities were employed; the characteristics are shown in Table I.

Table I.—Mineral Oils Employed

No.	Specific Gravity at 15.5° C.	Sayboldt Vis. at 43.3° C.	Kinematic Vis. at 37.8° C.
1	0.885–0.895	335–345	0.735–0.757
2	0.880–0.890	320–330	0.702–0.724
3	0.875–0.885	200–210	0.437–0.460
4	0.875–0.885	175–185	0.381–0.404
5	0.875–0.885	125–135	0.265–0.290
6	0.850–0.860	80–90	0.156–0.182
7	0.835–0.845	65–75	0.117–0.144
8	0.830–0.840	50–60	0.074–0.103
U. S. P. Heavy	0.860–0.905 (25°)	...	>0.381
U. S. P. Light	0.828–0.880 (25°)	...	<0.370

Gels were prepared by dissolving the hydroxystearic acid in the hot mineral oil and allowing to cool. After standing several days at room temperature (about 23° C.), the consistency was determined. There was no trace of bleeding in the one per cent samples of any of the U. S. P. heavy or light oils (Nos. 1–6). The very light oils did not bleed with two per cent of the acid, but the one per cent gel bled a few drops in the case of No. 7 and about 1 cc. of a 50-cc. sample in the case of No. 8. The relative consistency is shown in Table II.

Official Ointments.—Jellified liquid petrolatum was found to be compatible with materials which are compatible with petrolatum and the resulting ointments were quite satisfactory. They possessed the advantage over petrolatum that they liquefied when applied to the skin, but remained solid at ordinary temperatures. The amount of hydroxystearic acid varied with the consistency desired and with the medicament. For example, in ointments containing considerable volatile oil, such as compound menthol ointment, more hydroxystearic acid was necessary.

The method of preparing the ointments consisted of dissolving or incorporating the medicament with the liquid petrolatum and adding the molten 20% solution of hydroxystearic acid in liquid petrolatum. If the amount of the acid solution was small, the liquid petrolatum solution was also warmed. Upon cooling, a jellified product results; agitation is not necessary if the material is soluble in the liquid petrolatum. If the material is insoluble, as for example, zinc oxide, agitation is necessary while cooling to prevent separation of the solid. If desired, the medicament may be incorporated with the solidified jelly prepared by warming the liquid petrolatum and adding the acid solution to this. A stock jellified liquid petrolatum may be prepared and used in the same manner as white petrolatum. The following examples are chosen to illustrate pharmaceutical compatibility and are not chosen for therapeutic fitness.

Camphor Ointment: camphor 22 Gm., liquid petrolatum 72 Gm., 20% acid 6 Gm.

Capsicum Ointment: oleoresin of capsicum 5 Gm., petrolatum 85 Gm., 20% acid 10 Gm.

Compound Menthol Ointment: menthol 10 Gm., methyl salicylate 10 Gm., liquid petrolatum 65 Gm., 20% acid 15 Gm.

Ichthammol Ointment: ichthammol 10 Gm., liquid petrolatum 80 Gm., 20% acid 10 Gm.

Mustard Ointment: volatile oil of mustard 2 Gm., liquid petrolatum 88 Gm., 20% acid 10 Gm.

Phenol Ointment: phenol 2 Gm., liquid petrolatum 88 Gm., 20% acid 10 Gm.

[1] Manufactured by National Oil Products Co., Harrison, New Jersey.

[2] Courtesy of L. Sonneborn Sons Inc., New York.

Table II.—Jellified Mineral Oils

Oil No.	% Acid	Consistency[a] 100 Gm.	200 Gm.	300 Gm.	400 Gm.	500 Gm.	1000 Gm.
1	4	0	0	tr	0.5	1.0	+
1	3	0	0	0.5	5.0	+	
1	2	tr	4.0	9.0	+		
1	1	0.5	+				
2	4	0	0	tr	1.0	3.0	+
2	3	0	0.5	2.0	10.0	+	
2	2	0.5	7.0	+			
2	1	2.0	+				
3	4	0	0	0.5	1.5	5.0	+
3	3	0	0.5	3.5	14.0	+	
3	2	0.5	10.0	+			
3	1	+					
4	4	0	0	1.0	3.0	10.0	+
4	3	0	0.5	4.0	18.0	+	
4	2	1.0	13.0	+			
4	1	+					
5	4	0	0	1.5	3.5	12.0	+
5	3	0	1.0	8.0	+		
5	2	3.0	+				
5	1	+					
6	4	0	0	2.0	8.0	+	
6	3	0.5	2.0	11.0	+		
6	2	3.0	+				
6	1	+					
7	4	0	2.0	3.0	13.0	+	
7	3	2.0	8.0	+			
7	2	7.0	+				
7	1	+					
8	4	1.0	3.0	5.0	15.0	+	
8	3	3.0	18.0	+			
8	2	9.0	+				
8	1	+					

[a] Mm. penetration in 60 seconds with weight noted; "tr" indicates trace; "+" indicates penetration to the bottom of the ar before 60 seconds interval.

Scarlet Red Ointment: scarlet red 5 Gm., liquid petrolatum 85 Gm., 20% acid 10 Gm.

The above ointments are, in the most case, materials which are more or less soluble in liquid petrolatum. The base is also satisfactory for substances which are insoluble as indicated by the following examples:

Ammoniated Mercury Ointment: ammoniated mercury 10 Gm., liquid petrolatum 80 Gm., 20% acid 10 Gm.

Boric Acid Ointment: boric acid 10 Gm., liquid petrolatum 70 Gm., 20% acid 20 Gm.

Sulfur Ointment: precipitated sulfur 15 Gm., liquid petrolatum 72.5 Gm., 20% acid 12.5 Gm.

Zinc Oxide Ointment: zinc oxide 20 Gm., liquid petrolatum 70 Gm., 20% acid 10 Gm.

Cosmetics.—The following are examples of cosmetics prepared using hydroxystearic acid as a jellifier.

Cold Cream

Stearic acid	4 Gm.
Spermaceti	4 Gm.
White wax	6 Gm.
20% Acid	25 Gm.
Liquid petrolatum	75 Gm.
Water	50 Gm.
Triethanolamine	2 Gm.

Melt the stearic acid, spermaceti, white wax and 20% acid in the order named, add the mineral oil, continue heating until a solution results. Dissolve the triethanolamine in the water and heat to the same temperature as the oil solution. Mix with a mechanical agitator until emulsified; stir occasionally while cooling. This cream differs from most creams in that it has a soft, jelly-like consistency.

Liquefying Cold Cream

20% Acid	50 Gm.
Liquid petrolatum	50 Gm.
Water	60 Gm.
Triethanolamine	2 Gm.

Heat the acid with the liquid petrolatum. Dissolve the triethanolamine in the water; heat to the same temperature as the oil solution. Mix with a mechanical agitator, and stir occasionally until cool. This cream readily liquefied when applied to the skin.

Liquefying Cream (Not Emulsified)

Spermaceti	5 Gm.
White wax	5 Gm.
20% Acid	20 Gm.
Liquid petrolatum	70 Gm.

Melt the spermaceti, white wax and 20% acid; add the liquid petrolatum, warming if necessary to effect solution. Stir until partially cool. This mixture readily melts when applied to the skin.

Brilliantine

20% Acid	17.5 Gm.
Liquid petrolatum	82.5 Gm.

Melt the 20% acid and incorporate with the liquid petrolatum, warming if necessary to effect solution. Allow to stand without agitation. A liquefying gel results.

Other Jellified Products.—Liquefying gels were produced when hydroxystearic acid was dissolved in other substances. Fixed oils, such as almond, linseed, cottonseed and sesame, produced gels with about 2.5% of hydroxystearic acid. Hydrocarbons such as kerosene and benzene produced transparent gels with 10% of the acid. Other hydrocarbons, benzene and toluene, required more hydroxystearic acid and produced a more opaque, somewhat granular appearing product. Gels were also produced with 10% of the acid in volatile oils such as turpentine and methyl salicylate.

SUMMARY

Hydroxystearic acid was shown to be a jellifying material for liquid petrolatum and fixed oils in quantities of 1 or 2 per cent. In larger quantities it also produced gels with hydrocarbons and volatile oils.

Liquefying ointments were prepared using jellified liquid petrolatum to replace petrolatum of the U. S. P. and N. F. formulas. The base appeared to be compatible with medicaments in the same manner as petrolatum and produced ointments which readily liquefied when placed upon the skin. The consistency of the final ointment varied with the amount of hydroxystearic acid present.

Used in cosmetics, the addition of hydroxystearic acid definitely improved the consistency of products containing liquid petrolatum, whether solutions or emulsions.

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Book Review

The Chemist's Dictionary of Synonyms, incorporating Rouse's Synonyms. Published at the Office of the Chemist and Druggist, 28 Essex Street, Strand, London, W. C. 2, 1940. 6 x 9, 136 pages. Price, postpaid, 5s., 4d.

The purpose of the publication is to supply definitions of terms for quick reference in the pharmacy and while the book is intended for the British pharmacy, it has related value for all pharmacists. Very likely British synonyms will be brought to the attention of American pharmacists more frequently because of war conditions.—E. G. E.

The Most Comprehensive Food and Drug Bill

Introduced into the United States Congress by William H. F. Lee (May 31, 1837, to October 15, 1891) Soldier, Agriculturist and Legislator

*By Lyman F. Kebler**

Of the more than one hundred food and drug bills introduced into the United States Congress, over a period of 25 years, that finally resulted in the enactment of the National Food and Drugs Act, June 30, 1906, Representative Lee's bill (H. R. 10320), introduced (1) June 4, 1888, is considered by many the most comprehensive. This is the first of the modern food and drug bills introduced into Congress by a Representative of Virginia. Congressman R. L. T. Beale of Virginia, a member of the Congress that enacted the Drug and Chemical import law in 1848, over thirty years later, introduced the second food bill in 1879 and Representative John S. Barbour of Virginia, introduced a food bill for the District of Columbia in 1886. Neither of the two latter bills covered drugs.

BIOGRAPHICAL SKETCH OF AUTHOR OF BILL

Representative William H. F. Lee was born in the Lee Mansion, just across the Potomac River from the Lincoln Memorial, the second son of the illustrious General Robert E. Lee and Mary Ann Randolph (Custis) Lee, the granddaughter of Martha Washington, by her first husband. This is another instance of a Lee marrying into a wealthy, prosperous, influential family. A study of these marriages forces the conclusion that the blending of the blood and fortunes of some of these wives with the Lees were distinct assets to successive generations. There seemed to be something in the female side that inspired their sons to greater endcavors.

One of objects of some of the marriages in those days was, in part at least, the combining of fortunes and families of influence. It should be noted that the oldest son inherited the major part, if not all of the family estate and that while the younger brothers usually inherited comparatively little, some of them increased it by winning the hands of wealthy heiresses. How well some of them succeeded is shown by a study of the history (2) and

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