

## II. Plate and tube cultures. (Lactose-litmus-agar.)

1. Temperature differential test.
  - a. (20° C.) colonies per cc.....
  - b. (38° C.) colonies per cc.....
2. Color differential test.
  - a. Pink or yellow colonies per cc.....
  - b. Not pink or yellow colonies per cc.....
3. Gelatine liquefying colonies per cc.....
4. Indol reaction ( $\pm$ ).....
5. Neutral red reduction ( $\pm$ ).....
6. Gas (hydrogen) formula.....
7. Gram-stain behavior ( $\pm$ ).....
8. Presumptive colon bacillus test ( $\pm$ ),
  - a. Amounts used .....
  - b. Number of tests.....
  - c. Rating .....

## III. Special tests .....

## IV. Conclusions .....

Analyst.

## WHITE MINERAL OILS, AMERICAN—PARAFFINUM LIQUIDUM— LIQUID PETROLATUM.

S. L. HILTON.

White Mineral Oils, or Paraffinum Liquidum, U. S. P. now on the American market are of American refining, for the reason that the Russian oils are unobtainable owing to various causes incident to the European War. A fact, not generally known, was that while these oils were made from crude material obtained in the Baku district they were not refined there and the processes of refining are held secret.

The Russian crude product differs chemically from that found in America, consequently, it has been necessary to devise and develop new processes that were applicable to refining and purifying the crude American product so as to be able to furnish an oil of similar character as the Russian, for internal administration, that would give equally as good results in intestinal stasis.

The requirements of the British Pharmacopoeia are more exacting than required by the U. S. P. VIII. No doubt the U. S. P. IX, when issued, will be as exacting; the standard that I have followed in the examination of these oils is that of the British Pharmacopoeia.

An oil containing an appreciable amount of unsaturated hydrocarbons when taken internally will result in chemical action in the digestive tract, generating gases and having a similar action to that of castor or croton oils, which is not

desired. The work of Dr. Lane was with an oil free from unsaturated hydrocarbons, of a rather heavy specific gravity, so that its action would be mechanical entirely. This is the oil that is desired and the one that has been used abroad and in this country for some time. With the disappearance of the Russian oil from the market, it has become necessary for American refiners to study the question and devise processes to properly purify and refine the American crude product obtainable, of quite a different character, so as to furnish an oil of high purity, free from unsaturated hydrocarbons, that would take the place of the foreign product now unobtainable. This the American refiners seem to have accomplished and they will no doubt further improve their products, after gaining more experience with the processes they have devised for purifying and refining.

An examination of fifteen different samples of American oils now on the market shows varying results, those suitable for internal administration when subjected to a temperature of  $-4^{\circ}$  C. for 4 hours are nearly or quite solid, some of them will show a distinct cloudiness with the slightest change of temperature. Another characteristic of the American oils is that they are generally of lighter specific gravity than the Russian oils, due evidently to the fact that they are obtained from material of a different chemical composition. The Russian oil is obtained from the crude product consisting chiefly of monocyclic polymethanes or naphthenes having a general formula  $C_nH_{2n}$ . The American crude oil is obtained from paraffin base petroleum and consists chiefly of hydrocarbons of the methane series having the general formula of  $C_nH_{2n+2}$ .

Richter makes the statement that paraffins are more abundant in petroleum from the Baku district than that found in America; my observations are to the contrary. In a comparison of experiments I made in February 1914, with those made at this time, I find that the American oils show decidedly more heavy paraffins than the Russian oils. I see no reason why this should affect the quality of the American oil or interfere in any way with its use for internal administration, provided they are saturated hydrocarbons. This can be readily determined by applying the sulphuric acid test; the showing of more than a pale brown color, after properly conducting the test as prescribed by the British Pharmacopœia, is sufficient grounds to reject the oil for internal administration.

After completing the examination as shown by the tabulated statement, I placed samples of the oils I considered best, in the hands of several physicians for experimentation and comparison of results they had previously obtained with Russian oils. In every case I have had most favorable reports and they have informed me that they were unable to notice any difference whatever in its action. I have therefore come to the conclusion that our American oils, when properly purified and refined, so that they are free from taste, odor and unsaturated hydrocarbons, that are water-white and with a specific gravity of at least .840 at  $15^{\circ}$  C., will answer every purpose that is desired and will give equally good results as the Russian oils when taken internally.

I herewith append tabulated statement showing the results obtained. Samples 1, 4, 5, 6, 7, 9, 10, 12, and 15 conform to the requirements of the British Pharmacopœia, which standard is more rigid than that required by the U. S. P. VIII. These oils are adapted for internal administration.

EXAMINATION OF AMERICAN MINERAL OILS.  
(Liquid Petrolatum.)

Sample	I	II	III	IV	V
Color .....	None	None	None	None	None
Odor .....	None	None	None	None	None
Taste .....	None	None	Decided petroleum	None	None
Acidity .....	Neutral	Neutral	Neutral	Neutral	Neutral
Sp. Gr. at 15 C. ....	.8436	.8553	.8603	.8561	.8424
Freezing Test	Very opaque solidified	Slightly opaque	Slightly opaque	Slightly opaque	Very opaque solidified
Heating on Platinum ...	Slight odor	Slight odor	Slight odor	Slight odor	Slight odor
Lead Oxide Test .....	Nil	Nil	Nil	Nil	Nil
Saponification Test .....	Nil	Nil	Nil	Nil	Nil
Sulphuric Acid Test .....	Pale brown	Brown	Dark brown oil colored	Pale brown	Very pale brown
Sample	VI	VII	VIII	IX	X
Color .....	None	None	Blue fluorescence	None	None
Odor .....	None	None	None	None	None
Taste .....	None	None	Decided petroleum	None	None
Acidity .....	Neutral	Neutral	Neutral	Neutral	Neutral
Sp. Gr. at 15 C. ....	.8542	.8555	.8647	.8435	.8516
Freezing Test	Opaque solidified	Opaque	Slightly opaque	Opaque solidified	Opaque solidified
Heating on Platinum	Slight odor	Slight odor	Petroleum odor, acrid	Slight petroleum odor	Slight petroleum odor
Lead Oxide Test .....	Nil	Nil	Nil	Nil	Nil
Saponification Test .....	Nil	Nil	Nil	Nil	Nil
Sulphuric Acid Test .....	Very pale brown	Pale brown	Very dark brown, oil layer violet	Pale brown, oil colored	Pale brown
Sample	XI	XII	XIII	XIV	XV
Color .....	Blue fluorescence	None	None	Blue fluorescence	None
Odor .....	Slight petroleum	None	Slight petroleum	None	None
Taste .....	Decided petroleum	None	Petroleum taste	None	None
Acidity .....	Neutral	Neutral	Neutral	Neutral	Neutral
Sp. Gr. at 15 C. ....	.8706	.8440	.8615	.8638	.8427
Freezing Test	Slightly opaque	Opaque solidified	Opaque partly solidified	Opaque partly solidified	Opaque partly solidified
Heating on Platinum ...	Decided petroleum, acrid	Slight odor	Decided petroleum odor	Slight acrid odor	Slight odor
Lead Oxide Test .....	Nil	Nil	Nil	Nil	Nil
Saponification Test .....	Nil	Nil	Nil	Nil	Nil
Sulphuric Acid Test .....	Orange on mixing dark brown, oil violet	Very pale brown	Yellow on mixing, reddish brown, oil violet	Yellow on mixing black, oil layer dark brown	Very pale brown

1. Refiner.
2. Dealer.
3. Pharmaceutical House.
4. Wholesaler.
5. Dealer.

6. Dealer.
7. Wholesaler.
8. Dealer.
9. Wholesaler.
10. Refiner.

11. Pharmaceutical House.
12. Pharmaceutical House.
13. Dealer.
14. Refiner.
15. Wholesaler.