# Note On the Determination of Volatile Hydrocarbons in Soap Products

B. S. VAN ZILE, E. W. BLANK and G. V. SCOTT
Research and Development Department, Colgate-Palmolive-Peet Company,
Jersey City, N. J.

The official method for the determination of volatile hydrocarbons as described in the Official and Tentative Methods of the American Oil Chemists' Society (1) recommends the use of a measuring burette that is cumbersome and that presents an inordinately large drainage error due to the connecting siphon and other glass surfaces in contact with the volatile hydrocarbon. In addition, the hydrocarbon distillate undergoes considerable exposure to the atmosphere with the corresponding danger of loss by evaporation.

The authors have designed and have used with success in this laboratory for some time past two types of improved traps; one for determining volatile hydrocarbons lighter than water and a second for determining volatile hydrocarbons heavier than water.

Figure 1 shows the constructional details and dimensions in centimeters of a trap suitable for the determination of volatile hydrocarbons lighter than water, while Figure 2 shows the corresponding details for a trap suitable for the determination of volatile hydrocarbons that are heavier than water. The traps are of 5 ml. capacity, calibrated to 0.1 ml.

These traps hold solvent evaporation and drainage error to a minimum. In addition, they are inexpensive and quite durable.

In using the trap shown in Fig. 1 it should be filled with water before proceeding with the distillation. The tip of the condenser should be placed about 1 to 2 cm. above the surface of the water. At the termination of the distillation the distillate can be brought within the calibrated portion of the trap by careful tilting and removal of water.

In using the trap shown in Fig. 2 the tip of the condenser should be close to the bottom of the bulb of the trap and the latter gradually lowered as the distillate comes over. It may be necessary to extend the tip of the condenser to facilitate its introduction into the trap.

It is perhaps pertinent to remark at this point that the wording of the official method for the determina-

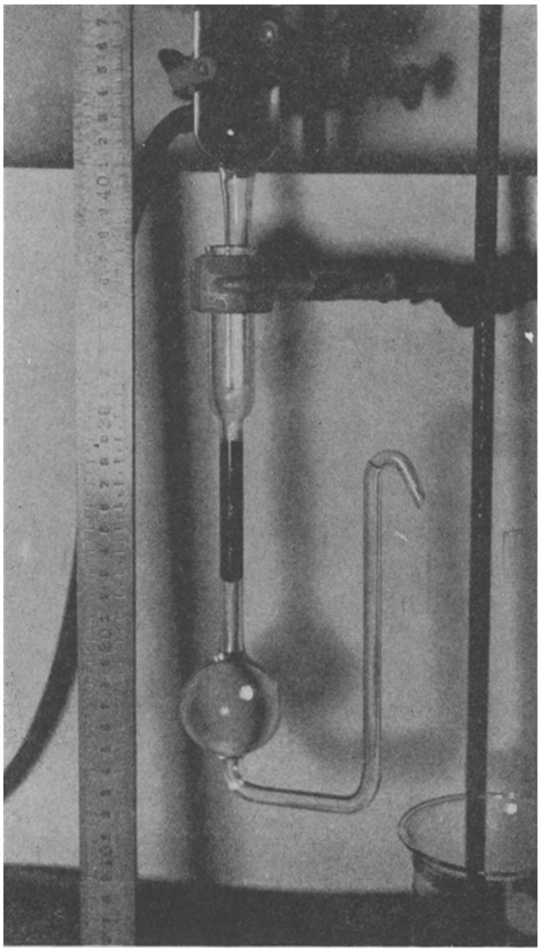

FIG. 1.

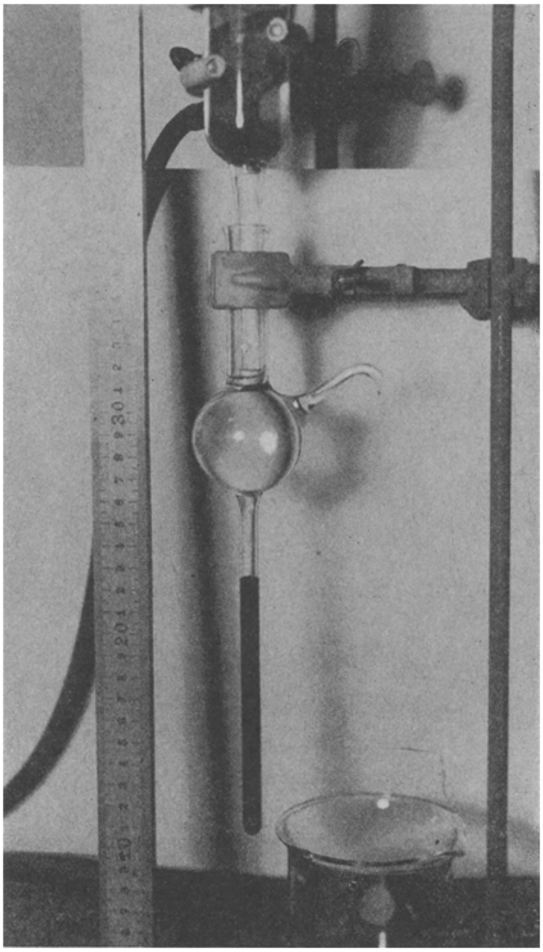

FIG. 2.

tion of volatile hydrocarbon does not preclude the use of the apparatus for the determination of halogenated hydrocarbons. The latter, usually chlorinated compounds, are in quite general use as constituents of dry cleaning soaps. In the event an attempt is made to determine the amount of chlorinated hydrocarbon present in a sample serious errors will result due to disruption of the chlorinated molecule by the caustic soda contained in the caustic scrubber. With chloroform, for example, sodium formate and sodium chloride are produced (2).

Several experiments were run to determine the magnitude of the error introduced. In each experiment a soap solution was prepared containing 30 grams of a sprayed soap. The soap was split with 1:1 sulfuric acid and the resulting mixture cooled before the addition of 5 ml. of the chlorinated hydrocarbon. The mixture was then distilled as described in the official procedure. Using the following solvents: chloroform, carbon tetrachloride, ethylene trichloride, and ethylene dichloride, the recovery showed losses ranging as high as 13%. In every case the caustic soda in the scrubber showed an increase in chloride content.

It was found that substitution of water for the caustic soda in the scrubber considerably lowered the per cent of loss of hydrocarbon recovered but did not entirely eliminate it. This is not surprising in view of the fact that the chlorinated hydrocarbons are slightly soluble in water. It appears advisable, on the basis of the above experiments to recommend the substitution of water for the caustic soda solution when determining halogenated hydrocarbons.

LITERATURE CITED

(1) Official and Tentative Methods of the American Oil Chemists' Society, p. A-11 (1941).

(2) Richter, "Organic Chemistry," third edition, translated by Allott, Vol. *1*, p. 291, Nordemann Pub. Co., New York (1934).

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# Abstracts

## Oils and Fats

Edited by
**M. M. PISKUR and SARAH HICKS**

A RAPID METHOD FOR THE DETERMINATION OF THE FAT CONTENT OF FISH TISSUES. W. W. Johnston. *Fisheries Research Board Can., Progress Repts. Atlantic Stas. 32,* 11-12 (1942). *(Atlantic Biol. Sta. Note 78).* Pass the fish livers or tissues through a fine chopper and dil. with an equal wt. of water. To about 15 g. of this material accurately weighed in a Babcock bottle add 25 cc. of a reagent prepd. as follows: To 440 cc. of 24% Rochelle salt soln. add 210 cc. of 20% NaOH soln., 265 cc. EtOH, 175 cc. $H_2O$ and 75 cc. BuOH. Heat the flask at 75° with occasional shaking till the oil seps. sharply (about ½ hr.). Float the oil into the neck of the flask with addnl. reagent and reheat until the contents reach 75°. Per cent oil = reading of flask × 35.6/wt. of dild. sample. The method gives reproducible results which agree closely with those obtained by solvent extn. if the material is in a good state of preservation. *(Chem. Abs.)*

THE DENSITY OF MILK FAT: ITS RELATION TO THE ACCURACY OF THE BABCOCK TEST. Robert Jenness, Ernest O. Herreid, W. J. Caulfield, L. H. Burgwald, E. L. Jack, and S. L. Tuckey. *J. Dairy Sci. 25,* 949-60 (1942). The density of the purified milk fat in this study was relatively constant and was not affected to any marked extent by breed, season, or feed. The density of the fatty materials estimated from Babcock test as fat is higher than that of the corresponding purified fat, but for both types of fat is less than 0.9 at 60°; this introduces a fundamental error in the Babcock test. The coefficient of expansion of the purified fat averaged $78.34 \times 10^{-5}$ and of the material estd. as fat, $75.58 \times 10^{-5}$.

THE FORMATION OF FAT BY THE FUNGUS ENDOMYCES VERNALIS. I. THE INFLUENCE OF THE COMPOSITION OF THE SUBSTRATE ON THE FORMATION OF FAT BY ENDOMYCES VERNALIS UNDER CONDITIONS OF FILM GROWTH. A. L. Bichkovskaya. *Microbiology (U.S.S.R.) 8,* 1170-80 (1940). The substrates studied were 7% yeast water, beer wort, and sucrose molasses. The presence of assimilable N, C, and P was necessary for the growth of a thick film, rich in fat. $(NH_4)_2SO_4$, $NH_4NO_3$, and $(NH_4)_3PO_4$ did not give good results with yeast water or beer wort but gave better results with the molasses, especially in the presence of chalk. Org. N as an asparagine, peptone and urea gave good results only with yeast water. A sugar concn. of 3-5% was found to be optimum; higher sugar doses retarded the process and the production of fat and caused large amts. of sediment. A deficiency of N in the presence of sufficient sugar reduced the yield of dry substance and increased the percentage of sugar. An excess of N with a deficiency of sugar produced a low yield in dry substance with little or no fat. A-P deficiency resulted in incomplete utilization of sugar while the effect of an excess of P was in the direction of a growth low in fat. At a sugar concn. of 5% the sugar was completely used up in 5-7 days. Thereafter, the no. of fat-contg. cells was reduced. *(Chem. Abs.)*

FAT FROM MUCOR MUCEDO. M. Blinc and M. Bojec. *Arch. Mikrobiol. 12,* 41-5 (1941). The optimum temp. for growth was from 20° to 25° and pH 7. Maltose and dextrose were the most readily utilized sugars and sucrose and lactose the least. Henneberg's wort and molasses were a favorable substrate. So far a yield of 6.5% crude fat has been obtained. The fat is characterized by a high I no.; it is like the fat of seeds. *(Chem. Abs.)*

OINTMENTS AND OINTMENT BASES. III. THE SUITABILITY OF PARTIAL GLYCERIDES OF FATTY ACIDS AS OINTMENT EMULSIFIERS. H. Muhlemann. *Pharm. Acta. Helv. 15,* 1-30 (1940). The nature of emulsifiers is discussed. The emulsifying action of mono- and di-glycerides was tested with yellow petrolatum. The max. effect was obtained with 3-4% glyceride. *(Chem. Abs.)*

CATALYTIC EFFECT OF SULFUR DIOXIDE ON THE CONVERSION OF FATTY OILS. C. van Vlodrop. *Chem. Weekblad 38,* 150-2 (1941). A finely dispersed stream of