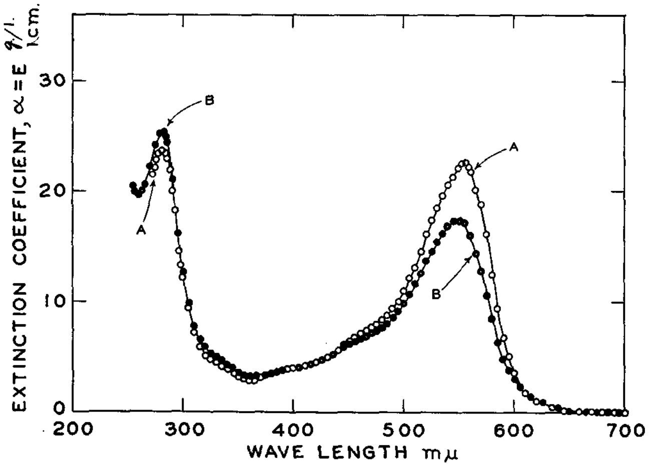

Fig. 3. Visible and ultraviolet absorption spectra of the water-soluble red pigment obtained from the tannin. Curve A—in n-amyl alcohol; curve B—in ethyl alcohol.

hydrochloric acid showed maxima at 280-81 and 552-54 mμ., with extinction coefficients of 25.83 and 19.1, respectively.

The water-soluble red pigment obtained from the tannin by refluxing with alcoholic hydrochloric acid gave qualitative tests indicative of an oxonium type structure. The visible portion of its spectrophotometric curve in amyl alcohol was similar to that reported for cyanidin chloride (11), but the elementary analyses, solubility, and other properties were quite dissimilar. Other points of variance were the failure of the pigment to give a picrate derivative and the relatively low extinction coefficients at positions of maxima in the absorption spectra.

All attempts to isolate a crystalline flavanone from peanut skins as described by Masquelier and Blanquet (4) were unsuccessful. The traces of oily product obtained gave qualitative tests characteristic of flavonic-type pigments.

Summary

The red skins of peanut kernels contain a catechol-type tannin. The purified tannin represented about 7% of the weight of the skins. Much smaller quantities of phlobaphene and so-called "leuco-anthocyanic chromogen" were isolated from the skins. Some evidence of the presence of traces of a flavonic-type pigment was obtained.

Spectrophotometric investigations of the isolated tannin, phlobaphene, and "leuco-anthocyanic chromogen" indicated a close relationship of the three pigments.

The tannin gave a water-soluble red pigment when refluxed with alcoholic hydrochloric acid. This pigment exhibited certain properties which are indicative of an oxonium-type structure.

The elementary analyses and certain properties of the isolated tannin and related pigments were considerably different from those reported by previous investigators. The amorphous nature of these substances makes chemical investigation difficult.

Acknowledgment

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Adaptation of the Volumetric-Evolution Method for Carbonates in Soaps to Synthetic Detergents[1]

NORBERT M. SCHUCK and WILLIAM H. KOESTER, The Procter and Gamble Company, Ivorydale, Ohio

THE advent of synthetic detergents and their phenomenal growth in diversity, complexity, and volume during the last two decades have produced many problems for the chemist. In the analytical field one of these problems has been the determination of carbonates, especially bicarbonates, in the presence of synthetic detergents. It is possible to isolate carbonates by utilizing an alcohol separation to remove the synthetic detergent. This technique fails when applied to bicarbonates since they tend to decompose in hot alcoholic solutions.

Methods

There are a number of reliable and comparatively simple methods for determining carbonates in soaps and soap-carbonate mixes, most of which are based on the evolution of CO_2. None of these methods succeed when applied to synthetic detergent-carbonate mixes because of the interference of foam and emulsions or the decomposition of bicarbonate. One of these is the Hitchcock-Divine Method (Oil and Soap *15*, 8-10, January, 1938) which has been adopted as A.O.C.S. official method DA 19b-42. In this method the CO_2, liberated in a closed, partially evacuated system, is absorbed in an alkaline solution. The excess absorbent is titrated along with a blank, and

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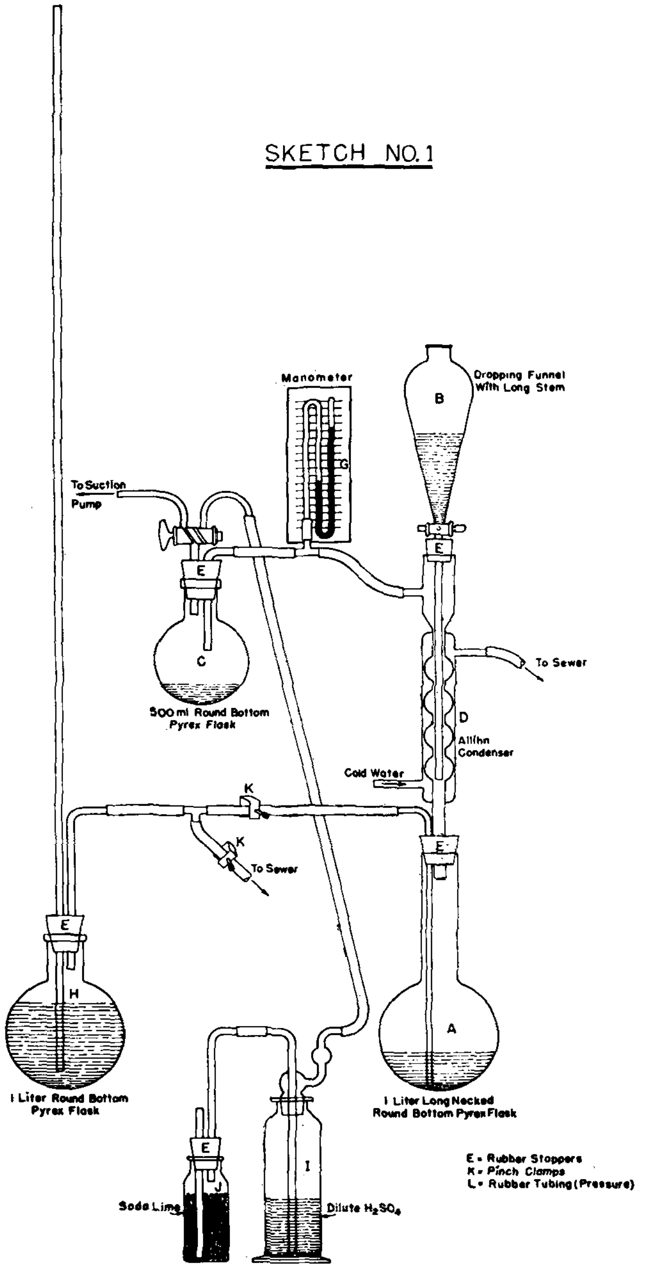
[1] Presented at the fall meeting of the American Oil Chemists' Society, Oct. 31-Nov. 2, 1949, Chicago, Ill.

SKETCH NO. 1



the difference is calculated as CO_2. For the sake of brevity, details about apparatus, reagents, and the procedure of this method will not be listed here. They can be found in the "Official and Tentative Methods of the American Oil Chemists' Society," Method Da 19b-42. All references mentioned below will be to this method.

Foam and Emulsions

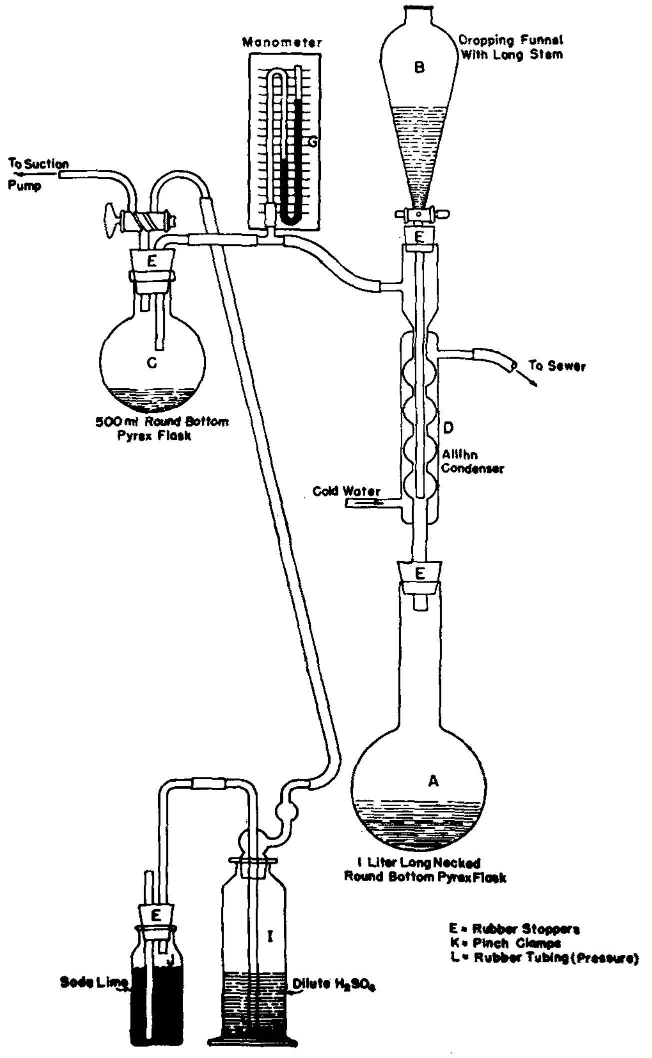
A simple modification of this method makes it possible to use it for determining CO_2 in all types of detergents. Foaming and troublesome emulsions are eliminated by using a hot 50/50 by volume solution of alcohol and water to dissolve the sample (procedure C-1) and to fill the flask and condenser (procedure C-6). When using the alcohol and water solution, a definite fire hazard exists so extreme care should be taken at all times.

Bumping

Excessive bumping can be reduced and controlled while boiling (procedure C-6) by two other modifications. The use of a steam generator (sketch 1) provides one method. After the connecting tubes and generator have been flushed with steam, a small current of steam, sufficient for agitation, bled through a tube to the bottom of flask "A" will prevent bumping. The same results can be obtained by introducing into flask "A" several glass rods of sufficient length to extend into the neck of the flask and then heating with an electric mantle in place of the flame prescribed under procedure C-6. The latter modification is preferred since the use of steam necessitates the delicate manipulation of two screw clamps to avoid the entrance of air or an excessive amount of steam into the system. Also, the danger of fire is almost negligible if an electric mantle is used

Additional modifications of the apparatus can be noted in sketches 1 and 2. To avoid excessive condensation in the manometer it has been connected between the condenser "D" and flask "C." The use of a larger condenser "D" has also proved advantageous since it reduces the possibility of the sample boiling over into flask "C."

SKETCH NO. 2



Application

The suggested modifications in procedure and apparatus described have been successfully applied for several years in our laboratory. They have proved satisfactory in the analyses of all types of detergents, anionic, cationic, nonionic, and in all types of mixtures and blends. Determining CO_2 accurately in many of these substances was practically impossible before the above modifications were introduced.

Summary

The suggested modifications make it possible to adapt the original method of Hitchcock-Divine to alkyl benzene sulfonates and similar types of synthetics which cannot be hydrolyzed. Alcohol instead of water solutions of the sample are used to eliminate foaming. An electric mantle, a CO_2-free stream of steam, or both can be used to prevent the solutions from "bumping" while boiling under vacuum.

[Received March 21, 1950]

ABSTRACTS . . . . Don Whyte, Editor

• Oils and Fats

R. A. Reiners, Abstractor

Studies on Indian edible oils. Groundnut oil. K. Ramamurti and B. N. Banerjee (Indian Inst. Sci., Bangalore). *Indian Jour. Med. Res.* 36 (4), 371-386(1948). Studies on market samples of groundnut (peanut) oil showed that a majority had a high F.F.A. content due to non-grading of the seeds before crushing. No direct relationship exists between color and F.F.A. although samples of high F.F.A. also show darker color. Free fatty acidity lowers the induction period, hydrolysis by pancreatic lipase, and the stability of carotene and vitamin A in peanut oil. Refining does not improve the induction period of high acid oil. Peanut oil of more than 1% F.F.A. is not well suited for storage or digestion. (*Biol. Abs.* Sect. G 24 [4], 23)

Production of oil from plum seeds. L. Hasko. *Mezogazdasag es Ipar* 2 (11), 27-8(1948). Seeds of *Prunus domestica* were disintegrated, the hard shell particles removed by flotation in a 20% solution of NaCl and the soft kernel processed as usual in sunflower-seed-oil mills. The oil had the following contents: acid no. 1.0, saponification no. 190.1, iodine no. 110.2, unsaponifiable 0.4%, solidification temperature of fatty acid, 6.4°. No toxic effects of the oil were observed in cooking. (*Chem. Abs.* **44**, 5121)

The composition and properties of the oil from the seeds of red currant (*Ribes rubrum* L.). J. Koblic. *Chem. Obzor* **24**, 118-21, 129-32(1949). The oil is clear, golden yellow, has a slightly varnish-like odor and a slightly fishy flavor, m. 9.3°, acid value 0.55%, saponification no. 192.3, iodine no. (Hanus) 154.0, unsaponifiable matter 1%. The fat acids have iodine no. 145.1, m. 19.5°, solidify 9.5°, neutralization no. 200.9, hexabromide no. as linolenic acid 2.58%. (*Chem. Abs.* **44**, 5120)

Hydrogenated whale oil. Its industrial uses. P. Merat. *Oleagineux* 4 (4), 203-212(1949). A review of the literature on the production of hydrogenated whale oil and its uses in the soap, margarine, and stearine industries. (*Biol. Abs.* Sect. G. 24 [4], 22)

Chemical examination of the fixed oil of *Artemisia scoparia*. D. B. Parihar and S. Dutt (Delhi Univ., Delhi). *Indian Soap J.* **15**, 161-5(1950). The scoparin and essential oil were removed from the air-dried flowering heads of the plant, and the residues were extracted with ethyl ether. A highly viscous, greenish fatty oil was obtained in 4.45% yield. The refined oil had the following characteristics: m.p. 49-51°, saponification value 192.4, iodine value 30.3, acetyl value 4.28. The oil contained the following fatty acids: myristic 5.1, palmitic 23.5, stearic 24.4, arachidic 18.0, linoleic 11.2, and oleic 10.1%. The unsaponifiable matter (2.1%) was composed of sitosterol 19.8% and hydrocarbon ($C_{34}H_{70}$) 80.2. (*Chem. Abs.* **44**, 5121)

Vegetable oils and their dependence on climate and soil. I. Oil of *Camellia japonica*. R. Dios and Maria G. Vieitez. *Anales Edafol. Y Fisiol. Vegetal (Madrid)* **8**, 791-810(1949). The oil content of seeds grown in Galicia was approximately that found by Japanese investigators in the tropics but was less than values from seeds grown in Germany. The iodine no. and m.p. approximated the minimum values for the oil shown by other investigators under different ecological conditions. The values for unsaponifiable fraction were approximately double those found elsewhere. (*Chem. Abs.* **44**, 5119)

Unusual plant oils for food purposes. O. A. F. Gnadt. *Pharm. Ztg.* **86**, 51(1950). The use of tobacco-seed oil and cold-pressed oil from *Datura stramonium* is discussed. The latter contains no alkaloids and has the following constants: acid no. 8.1, saponification no. 191.3, and iodine no. 106.4. (*Chem. Abs.* **44**, 4268)

Oil content of grape seed of the principal cultivated varieties and optimum conditions for obtaining oil. S. Gogalniceanu and E. Negreanu. *Analele Inst. Cercetari Agron. Romaniei* 15, 121-38(1943). The seed of Romanian grapes averaged 14.2% oil. Seed of red varieties were lower in oil content than the white. Petroleum ether was found to be a satisfactory extraction solvent. (*Chem. Abs.* **44**, 5120)

Gossypol content of cottonseeds of Belgian Congo and of their by-products. G. Neirinckx. *Bull. Agr. Congo Belge* **39**, 819-40(1948). Average gossypol content is in seeds 0.92, in kernels 1.48, and in cake 0.84%. (*Chem. Abs.* **44**, 5121)

Hydrogenation of oils. R. C. Galan. *Ion* **9**, 580-90(1949). Industrial hydrogenation of oils are described. (*Chem. Abs.* **44**, 4267)

New improved method of extracting fat from cheese, fresh curd, and milk for fat acidity determination. J. F. Bowen, E. G. Hood, and C. A. Gibson (Central Expt. Farm, Ottawa, Canada). *Sci. Agric. (Ottawa)* 29 (11), 551-552(1949). For the determination of fat acidity as an indication of the development of bacterial rancidity during making and curing of experimental Cheddar cheese, clear dry milk fat may be obtained by the methods described. For cheese milk a sample of the milk is churned and the fat, obtained as butter granules, melted and clarified by decanting and filtration. For raw curd, a sample is ground with boiling water in the Waring blendor, allowed to stand several hours at 0°F., the fat layer skimmed off, transferred to an Erlenmeyer flask, and churned by shaking. The fat is clarified by melting, decanting, and filtration. For maturing cheese, the sample is ground dry in the Waring blendor, allowed to oil off in beakers set in the boiling water bath, and the fat clarified by filtration. Bacterial changes in the milk fat between sampling and analysis are considered to be reduced to a minimum by these methods. (*Biol. Abs.* Sect. G. 24 [3], 31)

Micro-determination of erucic acid in fats and oils. G. Gorbach and H. Malissa. *Mikrochem. ver. Mikrochim. Acta* **33** (4), 365-367(1948). Erucic acid was determined in 20 mg. of oil or fat by using Gorbach's micro-instruments in the macromethod of Kaufman and Fiedler. (*Biol. Abs.* Sect. G. 24 [4], 22)

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