ice. Draw off water and replenish the ice as necessary to keep the container solidly filled with cracked ice. At the end of five and one-half hours from the time of immersion, remove the bottle and examine the oil. Winter oil must be clear, brilliant and limpid at the conclusion of the test.

The bottle must not be disturbed during the five and one-half hour period, nor must it be agitated when it is removed from the bath at the end of the test, as agitation will occlude air bubbles in the cold, viscous liquid. If it is desired to examine the oil during the duration of the test, additional samples should be introduced into the bath and examined when desired. The results, however, must be reported on a sample which is not removed until the five and one-half hour period has elapsed.

Editor's Note: This method is being considered by the Uniform Methods and Planning Committee, as a substitute for the present Cold Test Method.

ABSTRACTS

Oils and Fats

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Determining the number of double bonds in oils and waxes. E. Rossmann. *Angew. Chem.* **50,** 187-90 (1937). A review of methods. The Br vapor method is emphasized.

The benzine point, a new characteristic for castor oil. W. Leithe and H. J. Heinz. *Fette u. Seifen* **44,** 33-4 (1937). Procedure: Weigh 6 g. castor oil in a 25 c.c. Erlenmeyer flask, add exactly 10 c.c. benzine (d^{20} 0.706, $n_D(20°)$—1.3956). This is stoppered with a stopper contg. a thermometer graduated in 0.2°. The flask is heated while being shaken in a warm water bath until the contents become clear. It is then removed from the bath and shaking is continued until turbidity appears. The temp. at which turbidity appears is called the benzine point. This figure was 32.2 to 34.0° for 20 commercial samples. Adulteration of castor oil with 5% linseed, sunflower, peanut, soybean, or rape oil reduces this figure 2.7-3.2°; 10% adulteration causes a reduction of from 4.2 to 6.5°.

Characteristics of fat from mold. (Citromyces spec.). K. Taufel, H. Thaler and H. Schreyegg. *Fette u. Seifen* **44,** 34-8 (1937). The composition of the fat was glycerin 4.9, unsapon. 9.9, palmitic acid 5.8, stearic acid 10.0, oleic acid 34.4 and linoleic acid 34.4%.

Fat from yeast (Saccharomyces spec.). K. Taufel, H. Thaler and H. Schreyegg. *Z. Untersuch. Lebensm.* **72,** 394-404 (1936). The fat of yeast, *Saccharomyces spec.,* is composed of: glycerin 5.3, steam volatile acids 5.2, palmitic acid 9.5, stearic acid 5.9, oleic acid 47.6, linoleic acid 2.9, and unsapon. 19.6% (stearin 3.3 and squalen 16.3).

The detection of animal fats and oils especially hardened train (marine animal) oil in fat mixtures. S. H. Bertram. *Öle, Fette, Wachse, Seife, Kosmetik* **1937,** No. 2, 13-14. In an investigation on the *Tortelli-Jaffe reaction* the author noted that (1) the green color reaction with hardened train oil occurred when the prescribed AcOH was omitted; and (2) when the prescribed $CHCl_3$ was replaced with CCl_4, CH_3CHCl_2, or MeI, the reaction was negative; when it was replaced with MeBr or C_6H_5COCl the color reaction was weak; while replacing the $CHCl_3$ with perchloroethylene (C_2Cl_4) or $C_2H_2Cl_2$ the reaction was significantly stronger. With a purified $C_2H_2Cl_2$ the reaction was weak. Because of the weaker reaction in this purified solvent a check was made to ascertain whether $CHCl_3$ acted similarly. When pure $CHCl_3$, prepd. from alc., was used in the test on train oil, the reaction was negative. Use of impure $CHCl_3$ solvents, *i.e.,* contg. aldehydes yielded excellent positive reactions. A new procedure proposed for the detection of animal oils (except hog fat) was:—1 cc. of oil or fat is mixed with about 3 g. crystd. trichloroacetic acid in a test tube and heated 5 mins. at 60° in an oil bath. The tube is removed from the oil bath and 10 cc. $CHCl_3$ are added. Development of a violet color indicates the presence of animal oil or fat except for hog fat, for which the reaction is negative. An intense violet color is obtained with whale, seal, herring, pilchard, shark and egg oils; the reaction being equally good for the partially hardened and unhardened oils. Beef fat, butter fat, sperm oil and horse fat give weak reactions. A green color with strong fluorescence occurs with ergosterol. Pure cholesterol and pure phytosterol yield no color with the procedure. (*Chem. Abs.*)

The detection of arachis oil in olive and almond oils. Norman Evers. *Analyst* **62,** 96-100 (1937). Olive oil—A modified Bellier test was carried out: One cc. of oil is saponified with 5 c.c. of 1.5 *N* alcoholic KOH soln. by heating on a water-bath for 5 min.; 50 cc. of 70% alc. are added, followed by 0.8 cc. HCl (sp. gr. 1.16). Soln. is warmed and then cooled in water, while stirring with thermometer, so that the temp. falls 1° C. per min. If oil remains clear at 9° C., arachis oil may be regarded as absent. Almond oil—The test is identical except that the soln. must remain clear to 4° C. In both cases, olive and almond oils, 5% arachis oil will be detected. If the tests are positive, a usual confirmatory test for arachis oil should be carried out.

Proof for small amounts of butter fat in presence of cacao fat. J. Grossfeld. *Z. Untersuch. Lebensm.* **72,** 434-5 (1936). The butyric acid value was used as a criterion for detg. the percentage of butter fat in prepared samples of cacao fat contg. 0.8 to 11.3% butter fat. Calculations to ± 0.3 were possible using the formula: butter fat = 5.12B — 0.12R. B represents the butyric acid value and R the "restzahl" (residual value). The "residual value" is defined as the No. of c.c. of 0.01 *N* NaOH corresponding to the total amount of fatty acids in 0.5 g. sample which was not pptd. by $MgSO_4$ minus the butyric acid value.

Refractometric determination of fat in chocolate. J. Stanley. *Ind. & Eng. Chem., Anal. Ed.* **9,** 132-135 (1937). A rapid refractive method for detg. total fat in chocolate is described. The data necessary for use

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with an Abbe or butyro type refractometer in conjunction with tricresyl phosphate, dibutyl phthalate, or diethyl phthalate as solvent are graphically and some tabularly presented. The method should prove useful for control purposes.

Refractometric fat determination in cacao products. W. Leithe and H. J. Heinz. *Z. Untersuch. Lebensm.* **72,** 414-8 (1936). Data for using bromonaphthalene and petroleum fractions in the refractometric detn. of fat in cacao products are tabulated. The Bromonaphthalene and two petroleum solvents were compared by analyzing cacao products from several geographical sources. All results compared favorably with the fat content as detd. by extn.

Isoöleic acids (formed) in the hydrogenation of sunflower oil. V. M. Puzanov. *Masloboĭno Zhirovoe Delo* **12,** 444-6 (1936).—Solid acids sepd. by the Twitchell method from the fat mixt. obtained by hydrogenation of sunflower oil when oxidized as K salts with $KMnO_4$ in H_2O gave caproic and decanedicarboxylic acids, corresponding to 12,13-isoöleic and 12,13-isoelaidic acids, and pelargonic and azelaic acids, corresponding to oleic and 9,10-elaidic acids. (*Chem. Abs.*)

Effect of varying conditions in the catalytic hydrogenation of fatty oils on the nature of the reaction product. III. H. I. Waterman, C. van Vlodrop and J. A. Pezy. *Rec. trav. chim.* **55,** 854-8 (1936); cf. *C. A.* **27,** 1776.—Fatty oils and esters of fatty acids can be hydrogenated under atm. pressure at 50° with a reasonable velocity. The catalyst used in such expts. was prepd. in colloidal condition in the fatty oil by decompn. from a Ni carbonyl-N stream at 120-145°. The hydrogenation expts. with this Ni catalyst at 50-60° at ordinary pressure followed a homogeneous hydrogenation scheme. The colloidal Ni catalyst enables one to hydrogenate cod-liver oil partially at low temp.; this yields a product which still shows the Carr-Price (cf. *C. A.* **20,** 3020) reaction for vitamin A to a not greatly decreased extent. (*Chem. Abs.*)

Reaction speed and the reaction equivalent of fat splitting. H. P. Kaufmann and M. C. Keller. *Fette u. Seifen* **44,** 42-7 (1937). Data on the effect of the amount of water present and the temp. on the speed of splitting of sunflower seed oil are tabulated. The speed of splitting is increased by raising the temp. and further increased with 0.2% ZnO. The maximum splitting was independent of temp., but was greatly affected by the ratio of fat to water.

Synthesis of glycerides of isoöleic acid. A. Bonner & J. Stather. *Fette u. Seifen* **44,** 29-31 (1937). Iso-oleic acid, m. 35.5°, was separated from hydrogenated sunflower seed oil. The lead salts of fat acids and tribromhydrin were used to prepare tri-isoölein, m. 36.8; α-isoöleo-$\alpha'\beta$-distearin, m. 57°; and α-isoöleo $\alpha'\beta$-dipalmitin m. 46.5°.

Source and nutrition of flax and its relation to the degree of saturation of linseed oil. Karl Schmalfuss. *Fette u. Seifen* **44,** 31-3 (1937). The I value of the linseed oil produced from flax grown in field tests varied between 185 and 202. Fertilization of the flax with K and NH_4 salts results in increasing the proportion of linoleic acid in the oil produced at the expense of oleic and linolenic acids.

Quickly preparing stand oil. Ernst Rossmann. *Fette u. Seifen* **44,** 59-60 (1937). Heating the oil in vacuum is the quickest means of preparing stand oil.

PATENTS

Apparatus for treating a continuous stream of material as in chilling lard, etc. C. W. Vogt and W. E. Snyder. U. S. 2,063,065-6. Structural features of shortening chilling apparatus are given.

Enzymes for fat splitting. Etsuo Takamiya. Fr. 802,772, Sept. 15, 1936. An enzyme for splitting oils and fats is obtained by treating seeds of plants contg. the enzyme or their pressed cakes (the content of fats and oils of the primary material being above 5%) at below 50° by a normal soln. of 0.6 to 1.2 of H_3PO_4, H_2SO_4, HCl or HNO_3, the amt. of acid chosen being between the limits of 40 and 5% of the primary material to form a very soft mass. The enzyme is thereby split off from its assocd. protoplasm and is recovered in known manner. (*Chem. Abs.*)

Deoxygenation of vegetable oils. Henri Lavoisier (Daniel Gardner, inventor). Fr. 801,991, Aug. 24, 1936. Oils such as olive, peanut, palm, cabbage palm, maize, cotton and turnsole oil are transformed to hydrocarbons by heating them, preferably under vacuum, in the presence of a substance such as CaO or BaO, with the addn. of CaC_2 or CaSi. The deoxygenation is followed immediately without previous condensation, by a cracking operation to increase the fraction of light liquid hydrocarbons obtained. (*Chem. Abs.*)

Driers for varnish oils. F. Meidert (I. G. Farbenind. A.-G.). Ger. 636,092 Cl. 22h 2. Wool fat is saponified with an excess alkali; the excess alkali is neutralized with naphthenic acid and then the soap mixture is ppt. with a heavy metal salt soln.

Hydrogenating oils, etc. Röhm & Haas Co. Fr. 802,542, Sept. 7, 1936. Esters such as glycerides and oils such as palm and coconut oil are hydrogenated to the corresponding alcs. by the action of H under a high temp. and pressure and in the presence of a catalyst comprising Co and Ag or their oxides. Examples are given. (*Chem. Abs.*)

Vegetable and animal oils. Olivol, S. L. Lubrificantes Españoles. Fr. 802,163, Aug. 29, 1936. These oils, which have or have not been oxidized to increase their viscosity, are neutralized by a paste formed by mixing or dissolving NaOH, KOH or other mineral alkali in glycerol of 28-30 degrees. The products may be mixed with other oils to form *lubricants*. (*Chem. Abs.*)