tact agent by this element is substantially eliminated.

Perhaps the greatest difficulty encountered in making hydrogen from hydrocarbons and steam is the heating of large masses of catalytic materials, since the reaction is highly endothermic. Addition of air or oxygen to the reactants and therefore internally heating the reaction system through partial oxidation of methane, for example, to carbon monoxide and hydrogen (which is an exothermic reaction) does not appear particularly advantageous. In the first place, unless a very considerable proportion of methane is oxidized, insufficient heat is introduced to counterbalance the endothermic interaction of hydrocarbon and steam. Secondly, if air is employed as the oxidizing agent, an extraneous gas (nitrogen) is introduced into the system. Third, some types of catalysts appear to be poisoned by this extraneous gas. One method of overcoming these objectionable features is the burning of hydrocarbon gases in heat-exchange relation to but out of contact with the reacting gases.

Instead of effecting production of hydrogen in one operation, two-stage processes may be employed. For example, cracking gas and steam may be reacted at 870° C. in the presence of a catalyst, the products being mainly carbon monoxide and hydrogen. More steam is introduced into the mixture and further reaction effected at 455° C., whereby carbon monoxide is converted into carbon dioxide. Compression of the resulting gaseous mixture under 240 lbs. per sq. in., followed by washing with water and with triethanolamine yields a gas containing about 97 per cent hydrogen.

As a catalyst, nickel appears to be universally accepted as the best. When admixed with other metallic oxides, such as those of aluminum, zinc, molybdenum, manganese and even those of a highly basic character, e.g., potasium oxide, its catalytic effect is said to be enhanced. Cobalt and iron are reported to be good contact agents, though less effective than nickel. At temperatures above 1000° C., zirconia and thoria are stated to be particularly active catalysts.

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ABSTRACTS

Oils and Fats

Edited by
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POLYMERIZATION OF FAT IV. POLYMERIZATION OF DRYING FAT WITH THE INFLUENCE OF SULPHUR CHLORIDE. H. P. Kaufmann and S. Funke. *Fette u. Siefen 45*, 670-4 (1938). A theory of polymerization with SC1 is graphically presented.

REVIEW OF PROPERTIES AND TYPES OF AIR OXIDIZED LINSEED OIL. T. Crebert. *Fette u. Seifen 45*, 674-6 (1938). Oil emulsions in paint technic. H. Wigner. *Ibid.* 676-80 (1938).

SIMPLE METHOD OF DETERMINING UNSAPONIFIABLE AND ITS CONSTITUENTS IN FOOD FATS. J. Groosfeld. *Z. Untersuch. Lebensm. 76*, 513-30 (1938). Methods for detg. unsapon. matter using 50 and 200 cc. of petrol. ether and method for detg. phytosterol are described. The cholesterol in butterfat, hardened whale, linseed, peanut and olive oil and cacao-butter was similar in amt. to that in lard. In coconut fat there was a larger amt. Results on phytosterols were similar. In tests without fat the extn. losses of cholesterol and phytosterol did not depend on the amt. of alc. Coco fat soap has a greater retaining capacity for the sterols than other soaps. Equation for calcg. the amt. of sterols and hydrocarbons and total unsapon. in fats is presented. Data for the equation are obtained by detg. unsapon. by 2 methods.

OIL HARDENING WITH COPPER-NICKEL CATALYST. W. Norman. *Fette u. Seifen 45*, 664-9 (1938). A hydrogenation app. made with laboratory glassware is illustrated and described in detail. The data on the activity of Ni-kieselguhr, Ni-Cr, Ni-formate and severeal Ni-Cu catalysts are tabulated and plotted. The curves show the rate of H uptake. The results are discussed from the standpoint of Cu improving the Ni-catalyst by acting as a carrier or it may, according to other investigators, prevent sintering of the Ni. The hardening odor of fats hardened with Ni-Cu is weaker and somewhat different from those with Ni, catalyst, but the odors increase rapidly on standing in air.

THE FATTY ACIDS AND GLYCERIDES OF SOLID SEED FATS. VI. BORNEE TALLOW. W. J. Bushell & T. P. Hilditch. *J. Soc. Chem. Ind. 57*, 447-9T (1938). The chief glycerides in the fat were "oleo"-distearins (about 40%), "oleo"-palmitostearins (about 31%) and stearodi-"oleins" (about 13%), with about 8% of "oleo-"dipalmitins and about 5% of fully-satd. glycerides.

STUDIES OF THE ESSENTIAL UNSATURATED FATTY ACIDS IN THEIR RELATION TO THE FAT-DEFICIENCY DISEASE OF RATS. E. M. Hume, L. C. A. Nunn, I. Smedley-Maclean and H. H. Smith. *Biochem. J. 32*, 2162-77 (1938). It is concluded that the ability of unsatd.

fatty acids to supplement a fat-free diet in promoting wt. increase is not necessarily associated with ability to heal skin lesions.

Destruction of vitamin A by rancid fats. E. J. Lease, J. G. Lease, J. Weber and H. Steenbock. *J. Nutr. 16,* 571-83 (1938). Rancid fats were found to destroy pure carotene and vitamin A or precursors thereof as contained in halibut liver oil, egg yolk, or alfalfa. Ozonized fats and palmitic peroxide also destroyed vitamin A. Heating of rancid fats lowered both their capacity to destroy vitamin A and their peroxide value. The addition of ascorbic acid, hydroquinone, gallic acid and ethyl gallate to rancid fats as antioxidants did not prevent the destruction of vitamin A. Vitamin A was not destroyed when given to rats on an empty stomach even though they were being maintained on a ration rich in rancid fat.

PATENTS

Treatment of oiticica oil. J. P. Stancil. U. S. pat. 2,139,864. Stearins are separated from the oil by a heat treatment followed by partial cooling and filtering.

Hydrogenation of soybean oil. H. E. Moore and R. B. Vogel (to Capital City Prod. Co.). U. S. 2,136,-653. To produce a margarine fat, soy bean oil is hydrogenated at 177-225° C. for 3 hrs. or more in the presence of a relatively inactive catalyst to reduce linoleic acid glycerides to less than 10% and to develop between 20 and 50% isooleic acid with satd. glycerides not exceeding 20%.

Apparatus for refining oils. B. Clayton, W. B. Kerrick and H. M. Stodt (to Refining, Inc.). U. S. 2,137,214. The app. comprises oil and alkali supplying means, mixing chamber, pumps, metering devices, heaters, pressure chambers and centrifugal separators.

Treatment of soya bean oil. A. K. Epstein et al. (to The Emulsol Corp.). U. S. 2,140,793-4. The prereversion period of soybean oil is extended by addn. of 0.5% aliphatic polyhydroxy substance or 0.1% of a sugar, heating under reduced pressure to temp. sufficiently high for deodorization.

Manufacture of catalyst. S. Faulkner (to Procter and Gamble Co.). U. S. 2,140,400. The Ni is pptd. as the carbonate is aq. soln., boiled to reduce the combined CO_2 content and until the suction filtered ppt. amts. to 9 cc. per g. of metal content and continued for 12 min., afterwards reducing the pptd. carbonate to metal by a wet reduction step.

Antiparasitic compositions. B. R. Harris. U. S. 2,134,917. The anti-parasitic composition comprises a nicotine salt of coconut oil fat ester of glycerol monosulfate.

Motor fuel containing nitriles. V. Conquest (to Armour & Co.). U. S. 2,135,327. Fat acid nitriles when added to motor fuels impart antiknock qualities to the fuel.

ABSTRACTS

Soaps

Edited by M. L. SHEELY

The use of aluminum in the soap industry. H. Lichtenberg. *Fette u. Seifen 45,* 518-21 (1938). Al app. has the advantages of resistance to corrosion by fatty acids, a high heat-transfer coeff., and avoidance of product discoloration.

The detergent qualities of soft soaps. Edwin J. Rathbun and Edward D. Davy. *J. Am. Pharm. Assoc. 27,* 836-40 (1938). As a result of a study of the relative efficiencies of soaps made of corn, soybean, coconut and linseed oils and 3 brands of com. oleic acid, with NaOH and KOH the following formula and procedure for the prepn. of sapo molis are recommended: dissolve 103 g. KOH in 120 cc. of H_2O, add the soln. to 510 g. of cottonseed oil, mix, allow to stand with occasional mixing until a small portion of the soap, when dissolved in distd. H_2O, makes a clear soln.; adjust the alky. to not over 0.04% and add H_2O to 1000 g. As a demand exists for a soap contg. some coconut oil because of its added lathering qualities, the following formula is recommended: cottonseed oil 408, coconut oil 102, KOH 109 g., distd. H_2O 120 cc.; prep. as for sapo molis. The following is recommended for liquor cresolis saponatus: cottonseed oil 350 g., KOH 71 g., distd. H_2O 90 cc.; saponify as for sapo molis, add cresol 500 cc., H_2O to 1000 cc. Sapon. of the oil is incomplete in the presence of cresol; addn. of cresol to the neutral soap makes a brilliantly clear product that can be dild. as desired without clouding the soln. (*Chem. Abs.*)

Termodynamic behavior of liquid crystalline solutions of sodium palmitate and sodium laurate in water at 90°. Robert D. Vold and Marjorie J. Vold. *J. Am. Chem. Soc. 61,* 37-44 (1939). The vapor pressure of aqueous sodium laurate at 90° has been measured as a function of its concentration and the existence of waxy soap as a separate phase has been confirmed.

The activities of sodium palmitate and sodium laurate have been calculated for each of the phases present in aqueous systems at 90°. Possible models of each of these phases are described. The models proposed account qualitatively for the experimental activity concentration curves of middle soap and neat soap.

Up-to-date manufacture of soap flakes without nigre. H. Zilske. Seifens.-Ztg., 1938, 65, 315-316. Tedious settling on a nigre is avoided in the described system of saponification, which includes two treatments of the soap mass with "Blankit" (once to modify the Fe-containing impurities, and once to bleach the soap) and a final settling on an alkaline lye; the made soap is shredded and dried to 84-85%