Notes of the Industry

Ask Higher Duty on Fatty Acids

Fred F. Jordan, of National Association of Stearic Acid Manufacturers, appeared before the Senate Finance Committee recently to request higher duties on stearic acid and stearine. The present duties are 1½ cents pound on stearic acid and 25 per cent on stearine. The new house bill provides for dutying both at 25 per cent. Mr. Jordan stated that large amounts of foreign material had been shipped into the country recently, and asked for an increase of rate to 50 per cent on both stearic acid and stearine. He also requested an increase in the duty on glycerine from 1 cent pound on crude and 2 cents on refined, the present rates, to 4 cents pound on crude and 6 cents on refined.

Continental Can Co. has recently acquired the assets and business of Eastern Shore Can Co., Hurlock, Md., and of Federal Can Co., Nashville, Tenn. The purchase of the latter plant opens up new territory not served by Continental Can Co. previously. W. D. Trabue, formerly with Federal Can Co., will join the Continental organization. About $5,000,000 will be spent by Continental during 1929 on plant construction, improvement of its facilities and purchases, of which amount $3,000,000 has already been spent. New plants are now under construction at Chicago, Oakland and Los Angeles, and construction work is also progressing at several other branch plants.

The oil of the avacado may soon be available commercially as a result of experiments by U. S. Bureau of Chemistry and Soils. Large amounts of cull fruit, not up to market standards, are available each year. Previous attempts at pressing have resulted in an emulsion of the oil with the watery juice of the fruit, which was not found satisfactory. The new process will involve dehydration of the sliced avacados at ordinary temperatures before pressing. The oil has a dark green color by transmitted light and is red by reflected light. It has a fruity odor, and will not become rancid easily, making it suitable for the soap kettle.

A. & E.-Niger Office Changes

Robert S. Hebert, manager of African & Eastern Trading Co.'s vegetable oil department, has moved his office to the headquarters of the Niger Co., 82 Beaver St., New York, to facilitate the carrying on of business until the actual combination of the two companies in this country. H. W. King, in charge of cocoa for Niger, has moved his headquarters to the African & Eastern offices at 10 Bridge St., New York. The parent companies in England have already been joined as United Africa Co., Ltd. Plans are on foot to effect the same merger in this country, the name of the combined companies to be United Africa Co., Inc.

Sir Robert Whaley Cohen, chairman of the board of United Africa Co., Ltd., arrived in the United States July 3 for a short stay. H. J. McFall, manager of the firm's cocoa department, has been here since late in June. Both men were formerly connected with African & Eastern Trading Co., Ltd.

To Use Planes in Whale Hunt

The American demand for increasing quantities of whale oil is being met by improvements in the ancient art of whaling. The whaler, C. A. Larsen, which takes whales in at the bow of the ship and which is equipped with complete machinery for whale oil production, is to be improved on by the Norwegian whaler, Norwega, which will use airplanes during the next season. Capt. Finn Luetzow Holm, noted arctic aviator, who left this country for Norway late last month, took a plane along to use in the East Antarctic. He expects that he will be able to quickly survey a large section of water and count the number of whales in any school.

Spencer Kellogg & Sons, Buffalo, will center their production of coconut oil in Kansas City. The old Palmolive brand, recently taken over by Spencer Kellogg, will be continued, and a new brand, Kellogg's edible coconut oil, will be manufactured.

Competition for the Norwegian whale oil enterprises in the Antarctic field is forecasted in the news that financial interests in New South Wales are attempting to form a new company with capital of £750,000.

Analysis Interpretation

(*From page 27*)

hydrochloric acid according to the following reaction: $NaOH + HCl = NaCl + H_2O$. The salt formed in this case is sodium chloride or "common salt."

21. **Cholesterol** — This is an alcohol which is present in all animal oils and the presence of it enables us to distinguish animal from vegetable oils. The latter contains a similar alcohol called phytosterol.

22. **Cloud Test**—The cloud test is run on oils for the purpose of discovering the presence of any impurities which may settle or separate out at lower temperature. The oil is chilled and the temperature taken at which it becomes cloudy. For some purposes an oil which becomes cloudy at too high a temperature cannot be used.

23. **Cold Test**—The cold test of an oil is the temperature at which the oil will just flow. It is of importance that this point be known fairly accurately in certain oils, e.g. Neatsfoot oil.

24. **Degras**—Degras is a common name for wool grease. It is a greasy exudation from the skin of sheep and is obtained by the washing of wool.

25. **Degras, Moellon**—This is not to be confused with ordinary degras. It is an oil obtained as a by-product in the process of currying leather and is formed by the oxidation of the fish oil in the leather. It is a mixture of unchanged fish oil, free fatty acids, and oxidized oil.

26. **Degras Former**—This is a resinous substance in Moellon Degras and consists principally of oxidized oil. The amount of it can be used as a measure of the extent to which the Moellon contains oxidized acids.

27. **Emulsify**—We emulsify two liquids when we so treat them as to form an emulsion. An emulsion is a suspension of very fine droplets of one liquid in another liquid. These droplets may be so small as to not be seen through an ordinary microscope. Emulsions are usually milky in appearance. Milk itself is a true emulsion of butter fat in water. Most sulfonated oils when added to water form a milky emulsion of oil in water.

28. **Extraction** — Extraction is the removal of a liquid from a solid by means of dissolving it in another liquid. No. 3 castor oil is made by treating the beans (from which No. 1 oil has been crushed) with some solvent such as carbon disulfide or petroleum naphtha. This solvent dissolves and extracts the oil from the bean pulp.

29. **Fire Test**—This is the lowest temperature at which an oil will give off vapors which when ignited will burn continuously. This is an important test in certain classes of mineral oils.

30. **Flash Test**—This test is used to determine the flash point of an oil. The flash point is the lowest temperature to which an oil must be heated to give off vapors which, when mixed with air, produce an explosive mixture.

31. **Glyceride**—A glyceride is an ester (see Alcohol) formed by the action of a fatty acid on glycerol or glycerine. Our most common glycerides are those of palmitic, stearic and oleic acids and are called respectively: palmitin, stearin, and olein. Glycerides constitute by far, the major portion of all fatty oils.

32. **Glycerine**—Glycerine or glycerol is an alcohol which is found in the majority of fats and oils in combination with fatty acids as glycerides. If these glycerides are treated with an alkali, a soap is formed and free glycerine is liberated.

33. **Gravimetric**—If, in analyzing a substance chemically, the amount of any constituent is determined by weighing, then the analysis is called gravimetric.

34. **Gravity**—Gravity is the force of attraction between any two bodies in space. We are principally interested in the force or pull exerted by the earth upon bodies on the earth. This pull is determined by weighing.

35. **Gravity, Specific**—Specific gravity is the measure of the pull of the earth on a unit volume of a substance, or the weight of a unit volume of a substance, when referred to pure water as a standard of 1.0000. Substances having a specific gravity of less than 1 are lighter than water. Those having a specific gravity of more than 1 are heavier than water. All fatty and mineral oils have specific gravity of less than 1 and are therefore lighter than water, and will float on it. Due to the expansion and contraction of oils with change in temperature, the temperature at which the specific gravity is taken must always be included in a report. For instance, the specific gravity of Palm Oil is .9236 at 15° C.

36. **Hydrogenation** — This is the term used for the treatment of certain oils with hydrogen gas at high temperatures in the presence of small amounts of foreign substances known as catalysts. The hydrogen combines with the oil to form solid fats having a much higher titre (See Titre) and

much lower Iodine Value (See Iodine Value). Cottonseed oil, for example, may be hydrogenated to a solid fat of a waxy hardness. The hydrogenation process is of great importance in making lard substitute and in the soap industry.

37. **Inorganic**—This is used to describe those compounds which are of mineral, rather than organic origin.

38. **Iodine Value**—This is a measure of the drying powers of a fatty oil. The drying of an oil is due to its taking up of oxygen from the air. In the same way, it will take up Iodine, and the amount of Iodine absorbed is an accurate index of its drying power. All oils have their own specific iodine values and the determination of the value is of great aid in identifying oils. The non-drying oils have low iodine values, e.g. palm oil 53, cocoanut oil 10, tallow 56. The semi-drying oils have slightly higher values e.g. cottonseed oil 108, corn oil 115. The drying oils are still higher e.g. Linseed Oil 176, Soya Bean Oil 140, Cod Oil 160.

39. **Linoleate**—A linoleate is a combination of any metal with linoleic acid, and is therefore a soap. (See Soap.) If the metal used is one of the alkalis (Sodium, postassium, or ammonium) the soap is soluble in water, and is suitable as a detergent or for being used for its cleaning power. If, however, the metal is any other than one of the alkalis, the resulting soap is insoluble in water and belongs to the class of materials that are commonly called "metallic soaps."

40. **Moisture**—In the analysis of sulfonated oils the moisture content is of extreme importance since oils are bought and sold largely on this factor alone. A "50% oil" should contain 50% moisture, a "40% oil" should contain 60% moisture, a "75% oil" should contain 25% moisture. A variation of over 2% from the claimed moisture content is too great to be allowed. This important test has been performed in various ways all of which give different results. The standard method is that of the American Leather Chemists' Ass'n. It is as follows and should absolutely be insisted upon in sulfonated oil analysis for purposes of comparison: "Weigh into a small beaker containing 5 to 10 grams of dried oleic acid, a small sample (2 to 3 grams) of the oil to be tested. Weigh accurately in order to determine the exact weight of the sulfonated oil added to the mixture. Place the beaker on a hot plate or in a drying oven and heat at 100° to 102° C. to constant weight. Cool in a dessicator and weigh. The loss in weight indicates the amount of water present (moisture content) in the sulfonated oil. This loss divided by the original weight of the sample multiplied by 100 equals the percent of water." The above method is also suitable and widely used in the determination of the moisture content of soaps and raw oils.

41. **Nitrate**—A nitrate is a salt and is made by the action of any alkali on nitric acid. $NaOH+HNO_3=NaNO_3+H_2O$. The nitrate formed here is sodium nitrate or Chile saltpetre. Potassium nitrate, KNO_3, is commonly known as saltpetre.

42. **Oil, Fatty**—The fatty oils are the vegetable and animal oils. They differ from the mineral oils in their chemical composition, being compounds of organic acids such as stearic acid, and alcohols such as glycerine. They invariably contain carbon, hydrogen, oxygen in their chemical make-up.

43. **Oil, Mineral**—The mineral oils, or petroleum oils, differ from the fatty oils in that they are hydrocarbons, i.e. compounds containing only carbon and hydrogen. They are not acted upon by alkalis, as are the fatty oils, and hence are unsaponifiable.

44. **Oil, Neutral**—Neutral oil is mineral oil with the bloom or fluorescence removed by filtration and exposure to sunlight. The term "neutral oil" is also applied to that part of certain sulfonated oils which is still in the form of a glyceride and has not been acted upon to liberate free fatty acid.

45. **Oil, Sulfonated**—A sulfonated oil is a fatty oil that has been acted upon chemically by sulfuric acid to form sulfo-fatty acids, and then washed and the excess acid neutralized with an alkali. There is always present in sulfonated oils, to greater or less extent, water, soap, glycerine, ash, and neutral oil.

46. **Opaque**—A solution of a liquid is said to be opaque when it transmits light to such a small extent that objects cannot be distinguished upon looking at them through the liquid.

47. **Organic**—This term is applied to chemical substance or processes when they are of living (i.e. vegetable or animal) origin. All organic substances have carbon as a constituent, and usually also have hydrogen or oxygen. Fats and oils are organic substances, as opposed to the mineral acids and salts which are inorganic in nature.

48. **Oxidation**—In a limited way, oxidation is a chemical reaction between any compound and oxygen. The term has now

(*Turn to page* 42)

Analysis Interpretation

(*From page 37*)

been extended in chemistry to include other elements than oxygen. With reference to oils, however, oxidation is usually the chemical action of oxygen on the oil. The drying of oil is an oxidation process, the oil being acted upon by the oxygen in the air. In inorganic chemistry the rusting of iron is a good illustration of oxidation.

49. Oxy—When oxygen combines in a certain way with the fatty acid of an oil, we have oxy-fatty acids formed. They are usually of a higher titre than the fatty acids themselves and may separate out at ordinary temperature. Rancidity is often due to the presence of these oxy-acids.

50. Palmitate—A palmitate is a combination of any metal with palmitic acid and is therefore a soap. (See Soap.)

51. Potash—This is the common name for potassium carbonate. Potash is often used in the industry to designate potassium hydroxide. To be strictly correct, however, the term caustic potash should really be used, although custom has made the terms equally applicable to either the carbonate or hydroxide.

52. Precipitate—If, through a chemical reaction between solutions, a solid substance is formed which tends eventually to settle out, it is called a precipitate.

53. Precipitation—The act of forming a precipitate is called precipitation.

54. Qualitative—If, in analyzing an oil or any chemical substance, only the nature of the components and not the amount is determined, the analysis is called qualitative.

55. Quantitative—If an analysis is carried out so that not only the nature but the exact amount of constituents is determined. then the analysis is called quantitative. The amounts are usually expressed as percentages of the whole and should therefore total 100.

56. Resinate—A resinate is made by the action of any metal on rosin. The chief constituent of rosin is a fatty acid ($HC_{44}H_{63}O_5$). When an alkali reacts with this acid it forms a resinate which is therefore a soap (See Soap).

57. Salt—A salt is a compound of an alkali and an acid. Whenever any alkali reacts with any acid we invariably have formed a salt and water. It is analagous in every respect with the reaction in organic chemistry between an alcohol and an acid which gives an ester and water.

58. Saponifiable—By this term is meant "capable of being saponified." Fatty oils, such as vegetable and animal oils, can be saponified. Mineral oils cannot be saponified. The adulteration of fatty oils by mineral oils can often be detected by the presence of unsaponifiable matter. Fatty oils differ as to the amount of an alkali necessary to completely saponify them. By the analytical term "Saponification Value" is meant the number of milligrams of potassium hydroxide necessary to saponify one gram of oil. Accumulated data has shown that each oil has its own saponification value within certain limits. The presence of other fatty oils or of mineral oils as adulterant, can therefore be very often detected by the determination of this factor.

59. Saponify—To saponify a fatty oil it is treated with an alkali. This gives a soap of the fatty acid in the oil and free glycerine. Thus, if olein (See Glyceride) be treated with caustic soda, we have formed a soap, (sodium oleate), and glycerine. Mineral oils are not glycerides, cannot be attacked by alkalis, and hence cannot be saponified.

60. Saturated Solution— A solution is said to be saturated with respect to a substance when it contains in solution all of that substance it will hold at a given temperature. Any further addition of the substance will not dissolve. An addition of an entirely different substance will go into solution however. For instance, some potassium nitrate may be added to a saturated solution of sodium chloride and it will go readily into solution, whereas an addition of more solid sodium chloride will not dissolve provided the temperature is not raised.

61. Silicate—A silicate is a salt formed by the action of any alkali on silicic acid: $2NaOH+H_2SiO_3=Na_2SiO_3+2H_2O$. In this case sodium silicate is formed.

62. Soap—Soap is formed by the saponification of fats, that is, by the action of an alkali on a glyceride. It can also be formed by the action of an alkali on a free fatty acid. The alkalis usually employed are sodium and potassium hydroxides since they give soaps which are soluble in water. Soaps of other metals, such as calcium and aluminum are insoluble in water and find their uses in the manufacture of paints and in waterproofing.

63. Soda Ash—Soda ash is the common name for sodium-carbonate which has the same properties as, and is analagous to, potassium carbonate. (See Potash.)

64. Soluble—A substance is said to be soluble in another when it forms a perfectly homogeneous mixture with it within certain limits. Salt is Soluble in water but only up to a certain concentration. Alcohol is Soluble in water in all proportions.

65. Solution—A solution is the resulting mixture when two substances, one of which is soluble in the other, are brought together.

66. Solute and Solvent—When a solid dissolves in a liquid, the former is called the "Solute" and the latter the "Solvent."

67. Stearate—A stearate is a combination of any metal with stearic acid and is therefore a soap. (See Soap.)

68. Sulfate—A sulfate is a salt formed by the action of any alkali on sulfuric acid: $2NaOH+H_2SO_4=Na_2SO_4+2H_2O$. In this case the salt is sodium sulfate, commonly called Glauber's salt.

69. Sulfur Trioxide — Ordinarily called by its formula, SO_3. When an oil is sulfonated it forms a greater or lesser amount of sulfo-fatty acids. The amount of these acids formed is found analytically by the determination of the "organic SO_3." This term in an analysis therefore shows the degree of sulfonation of the oil. The terms "50% oil," "75% oil," etc., have nothing to do with the degree of sulfonation but simply show the moisture content. (See Moisture.) We may have two "50% oils" one of which is lowly sulfonated and one of which is highly sulfonated but both of which contain 50% water. Organic SO_3 varies from 2% to 8% in most sulfonated oils.

70. Superfatted—A soap is superfatted when the oil from which it was made is in excess of the alkali used to saponify it. An incompletely saponified oil is a superfatted soap, as is also a completely saponified oil to which an excess of oil or fatty acids has been added.

71. Titre — Titre is the solidification point of the fatty acids derived from a fat or oil. All pure fats and oils have a definite titre and it therefore serves as a means of identification for unknown oils.

72. Translucent—A solution or liquid is said to be translucent when the outline of objects can be but dimly distinguished upon looking at them through the liquid. It may be defined as midway between transparent and opaque.

73. Transparent—A solution or liquid is transparent when objects can be clearly distinguished upon looking at them through the liquid. All true solutions are transparent.

74. Unsaponifiable — By this term is meant "incapable of being saponified." (See Saponify.) In oil analysis the presence of unsaponifiable almost invariably denotes the presence of mineral oil or alcohols.

75. Viscosity — Viscosity is the resistance to flow. It is an important test in mineral oils since within certain limits it may be taken as a measure of the value of the oil as a lubricant. Spindle oils have a low viscosity while cylinder oils have a high viscosity.

76. Volatile—A substance is volatile if it is capable of passing off into a gaseous state under greater or less heat. By volatile substances are usually meant those that evaporate readily at ordinary temperature. Alcohol and ether are highly volatile. Oils are practically non-volatile.

77. Volumetric—When a constituent of a compound or mixture is determined by the use of standard reagents and the volumes of the reacting solutions are used to determine the percentage of that constituent present, the analysis is said to have been volumetric. This is in contradistinction to the gravimetric method in which weights are used instead of volumes.

March wood oil shipments from Hankow amounted to 3,353 short tons of which 3,038 tons went to the United States and 497 tons to Europe. Available stocks at Hankow at the end of the month were estimated to be 5,300 short tons. Reliable information regarding stocks at Wanhsien and Changteh is not available. Much of the stocks coming in during March are reported to have been adulterated.

Preliminary statistics show that during the first quarter of 1929 Sweden imported 23,460 tons of oilseeds of which soya beans comprised 17,034 tons. During the same period of 1928 Sweden imported 38,691 tons of which soya beans accounted for 30,843 tons. During the first quarter of 1929 Sweden imported 23,162 tons of oilcake as compared with 31,494 tons during the same period of 1928. This total figure of oilcake includes peanut, cottonseed, and sunflower seed.

The gingelly (sesame) crop of the Madras Presidency is estimated by the Department of Agriculture of the Madras Presidency to be 217,056,000 pounds as against 239,456,000 pounds in the previous year, and an average yield of 233,294,000 pounds in the previous year, and an average yield of 233,296,000 pounds.