

## Section on Scientific Papers

Papers Presented at the Fifty-Ninth Convention

### THE PHYSICAL AND CHEMICAL CONSTANTS OF SEVERAL UNUSUAL FIXED OILS—

*i. e.*, SILKWORM CHRYSALIDS, GRAPE SEED AND TEA SEED OILS.

CHARLES H. LA WALL.

The present day tendency in manufacturing operations is toward the utilization of materials which were formerly discarded as valueless and our knowledge is constantly being enriched by the publication of facts concerning substances which are being produced as by-products and for which appropriate uses must be found.

Three rather uncommon fixed oils have come into my possession recently which illustrate this modern tendency in an excellent manner. All of them were received from Mr. W. J. Warner, superintendent of a glycerin refinery at Berkeley, California.

*Silkworm Oil.*—Oil from silkworm chrysalids has been mentioned in literature several times as a commercial possibility. In the Journal of the Society of Chemical Industry, Vol. XXX, No. 9, page 555, it was stated that in the ten years preceding 1908 there were produced as a by-product of the silk industry in Italy alone, 32,000,000 pounds of the chrysalids, which were practically all used for fertilizing purposes. As they contain about 20 per cent. of fixed oil obtainable by expression or the use of solvents and as the residue after the extraction of the oil would possess a manurial value equal to or greater than the original material, the probability of such an oil becoming an article of commerce is clearly evident.

The sample of silkworm oil in my possession has a brownish-yellow color and a somewhat disagreeable odor. It has a specific gravity of 0.9221 at 15° C., an acid number of 17.76, a saponification number of 202.46 and an iodine value of 142.2. The refraction figure on the Zeiss butyro-refractometer was 70° at 25° C.

*Tea Seed Oil.*—Tea seed oil, as produced and used for edible and manufacturing purposes in Japan, is not derived from the *Thea sinensis*, the species of which produces commercial tea leaves, but from *Thea sasanqua*, a plant of totally different character cultivated only for its seeds. This oil, when obtained by expression, contains such notable quantities of saponin as to practically unfit it for edible purposes, though when made by extraction with volatile solvents it is practically free from that irritating substance.

The exact origin or method of preparation of the sample in my possession is

unknown. Its properties are as follows: Specific gravity, 0.9165 at 15° C.; acid number, 1.52; saponification number, 196.55; iodine number, 86.7; butyro-refractometer reading, 62° at 25° C.

*Grape Seed Oil.*—Grape seed oil has been produced for some time as a by-product of the wine industry in some parts of Europe, but until recently no attempt was made in this country to utilize the seeds. Several years ago the production of this oil was begun in connection with the seeded raisin industry and the output of oil was reported last year to have reached over 300,000 pounds. The sample submitted was a bland, pleasant nutty flavored oil of bright sparkling appearance and showing the following characteristics: Specific gravity, 0.9215 at 15° C.; acid number, 100.10; butyro-refractometer reading, 71° at 25° C.

The foregoing data are submitted as a contribution to the literature of these respective oils.

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## KEEPING QUALITIES OF SOME U. S. P. VOLUMETRIC SOLUTIONS (CONCLUSIONS)

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A. H. CLARK.

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At the Los Angeles meeting I commenced the presentation of a series of reports on the keeping quality of certain U. S. P. Volumetric solutions. These solutions have been under observation, in some instances for more than four years, and I wish to present a summary of the work done. In some instances the results are such as would warrant definite conclusions.

### TENTH NORMAL SODIUM THIOSULPHATE V. S.

Various schemes for the preparation and preservation of this solution were tried. The solution was made from common crystals and C. P. granular sodium thiosulphate using common hydrant water and distilled water. The solutions were made alkaline by the addition of varying quantities of sodium hydroxide. "Preservatives" were added in the form of thymol, resorcinol, formaldehyde, etc. The solutions were preserved in transparent bottles, amber bottles, cork stoppered or glass stoppered bottles, protected from the light, and exposed to the light. In every instance deterioration was shown in a comparatively short time.

Summary—Solutions made from C. P. thiosulphate and distilled water kept as well as any. Protection from light and the addition of alkali seem to retard the decomposition slightly but do not prevent it. So far as the result of these experiments go it is not safe to use a tenth normal sodium thiosulphate V. S. that is more than a month old, no matter how prepared and stored, without re-standardization.

### TENTH NORMAL POTASSIUM PERMANGANATE V. S.

Solution No. 1—This solution was standardized on April 5, 1908, and had a