

## NOTE ON THE PURIFICATION OF ALCOHOL FOR LABORATORY USES.

BY E. WALLER, PH. D.

Comparatively recently, several papers have appeared on the subject of the reactions of potassium permanganate with alcohols, and the impurities which they may contain.\*

In preparing alcoholic solutions of caustic alkalies, and also of silver nitrate (for fat tests, etc.), I have been annoyed, as have other chemists, by the unsatisfactory character of the solutions bought in consequence of the presence of impurities in the alcohol obtained for laboratory use. I find also that most alcohol of 93 per cent. when kept in tin cans, slowly reacts on the tin, giving, after a while a cloud of  $\text{SnO}_2$  which is too fine to filter out, and renders purification by distillation necessary. In the light of the results obtained by the writers above alluded to, I have adopted the following method for the purification of my alcohol, on which I ask the criticism of the members of the society.

A convenient amount of the alcohol to be purified is shaken with pulverized potassium permanganate until it assumes a decided color. It is then allowed to stand for some hours, until the permanganate has been decomposed, and brown manganese oxide is deposited. A pinch of pulverized calcium carbonate is then added, and the alcohol distilled at the rate of about 50 c.c. in 20 minutes from a flask provided with a Wurz tube, or one of the Lebel-Heninger pattern. The distillate is tested frequently until about 10 c.c. thereof, when boiled with 1 c.c. of strong (syrupy) solution of caustic soda or potash, gives no perceptible yellow coloration on standing for twenty minutes or half an hour. What distils over after that time is preserved for use.

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\**Habermann*. *Fres. Ztschr. anal. Chem.* 27, 663. *Roese*, ib. 28, 355.

*Caseneuve*. *Bull. Soc. Chim. (Paris)* [3] 1, 700. See also *Dingl. Polyt. Jour.*, 273, 374.

The first distillates may be added to the small amount remaining in the distilling flask (which should not be driven down to complete dryness), and a fresh portion of purified alcohol recovered.

The rationale of the proceeding appears to be that the permanganate oxides and destroys chiefly the fusel oil, furfural and other compounds of that nature, the acids resulting from the reaction are neutralized by the calcium carbonate added before distillation, and by distilling slowly, the aldehyde at least is concentrated in the first portions of the distillate. Distillation of alcohol containing caustic potash or soda seemed to cause a constant formation of aldehyde. The alcohol thus purified is perfectly neutral, and gives most satisfactory results when used as a solvent for caustic alkalies or silver nitrate, the solutions remaining as colorless as distilled water, even after boiling and standing indefinitely, if properly protected from dust and other external influences.

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## THE EXAMINATION OF COMMERCIAL GLYCERINE.

BY J. H. WAINWRIGHT, PH. B., F. C. S.

The Tariff law of 1883 imposes upon "Glycerine, crude, brown or yellow, of the specific gravity of one and twenty-five hundredths or less at a temperature of sixty degrees Fahrenheit, not purified by distilling or refining," a duty of two cents per pound; and upon "Glycerine, refined" a duty of five cents per pound.

In view of possible attempts to enter, through the Custom House, a partially refined glycerine as the crude article, a sample of every importation of so-called crude glycerine is submitted to the U. S. Laboratory for examination as to whether it is properly invoiced, or is partially or wholly refined; in the latter case it should pay the higher rate of duty. It has been always considered by the chemists at this port that the extent of "refining" properly permissible in a glycerine in order to bring it within the definition of *crude*, is the allowing of impurities to subside by long