

deposit does not extend far beyond the heated end of the tube. By increasing the heat it melts, but does not move forward.

*Chromium* gives a white coating which remains at the hot end of the tube. The portion nearest to this end, by further heating, becomes of a pale, reddish brown.

*Manganese*.—Yellow hot, but white when cold, like deposits from many other metals.

*Molybdenum*.—Beyond the yellow coating, which turns white on cooling, are distinct blue streaks, which are very characteristic. I believe these were first observed by Messrs. Wheeler & Ludeking by treatment with tincture of iodine, on tablets of plaster of Paris. I was not able with these tablets to get anything but a narrow fringe of blue around the yellow coating (white, cold). With a glass tube, the blue streaks extend through the whole length of the tube.

*Manganese and Uranium* give deposits which are yellow when hot and white when cold. These are too common to be characteristic.

I have obtained deposits on charcoal and on thin sheets of iron, either on the metallic surface or on a coat of soot, by the use of silver iodide and metallic compounds. Some of these deposits are very good, but they are not so uniform for the same metal as deposits obtained in glass tubes.

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## ON THE EXAMINATION OF BUTTER.

By MORTON LIEBSCHÜTZ.

Although it does not seem a matter of much importance, in the abstract, whether the fatty body used as food is derived from the fatty deposits of the animal, or from the emulsion called milk, the chemist is often compelled to decide whether a given sample is genuine butter or an imitation.

Dalican has given a method based on the percentage of *insoluble* fatty acids. He asserts that, as a nearly general rule, pure butter yields 86.5% of fatty acids while oleomargarine shows only 93.75%. His method which is excellent when time permits, and only a few samples are to be tested, is too tedious for general use. The washing of the fatty acids of pure butter requires at least two days, it being considered complete only when the water used for the operation remains perfectly neutral.

The determination of the glycerine would be, I think a shorter way of examination, and David's method of saponification by barium hydrate might be used with advantage. David proposed the method for the so-called titration of tallow, his plan being to extract the glycerine from a large sample of fat (100 grms.), to bring the glycerine to a known volume and to take its specific gravity. Knowing the percentage of glycerine contained in solutions of determined specific gravity, he calculated the yield in glycerine from the fat treated. This method has not, so far as the author is aware, been adopted, and it is doubtful if it will be. First of all the glycerine obtained is impure, containing compound salts of glycerine and baryta. For this reason the results are liable to vary with the different fatty bodies; the glycerine of each different fat will contain proportions of saline matters different from the glycerine yielded by the fat taken as a type, the solutions of which have been regarded as containing the standard amount of glycerine. Although we know that the *volumetric* determination of glycerine, or more properly the *hydrometric* determination cannot be used, the process of saponification may be applied with advantage to the examination of butter. We shall describe the method as it might be used for butter analysis. David's paper will be found in *Comptes Rendus*, 1882.

The sample of butter, so-called, is first melted in the air bath at 70°C. The clear fat rising above the water, salt and other impurities is decanted through a small dry filter, placed in a warm funnel, and the filtrate is collected in a small dish. About 20 grammes are taken, allowed to cool, and weighed, together with a small spatula. 10 grms. are removed and placed in a porcelain capsule of about 500 c.c., heated on a steam or water bath and when the fat is very warm 20 grms. of barium hydrate (9 mols. water) are added. When the emulsion has formed, pour in 30 c.c. of hot alcohol at 90°C., stirring briskly until the mass is nearly dry.

Add 200 c.c. of cold water; break the mass of barium soap with the spatula and boil, to reduce the liquid to one-half. Cool for a time, decant through a linen filter, repeating the boiling and the decantation three times at least, then, finally, throw the whole contents of the capsule upon the filter, after dividing the soap finely with a small pestle. Wash the filter with a few c.c. of water, and squeeze it with the fingers. Evaporate all of the solutions to about

100 c.c.; add litmus and neutralize cautiously with dilute sulphuric acid. Neutralize the slight excess of acid with barium carbonate. Filter the solution, wash the filter, and evaporate the liquor to a syrupy consistency.

As has already been said the glycerine so obtained is not pure. Treat the contents of the capsule with strong alcohol; a large quantity of salts is thrown down. The alcoholic solution is filtered through a small filter, previously moistened with alcohol, and the filtrate is collected in a tared platinum or porcelain dish. Evaporate the alcohol on the water bath and dry in the air bath above 100°C. to constant weight. After noting this, heat the glycerine, and burn it. The weight of the ash is deducted from the total weight; the difference is glycerine. The percentage of ash compared with the total percentage of glycerine is by itself an important factor, as glycerine derived by this mode of treatment from pure butter gives 5% of ash, whereas the glycerine of oleomargarine and other similar fats leaves only from 0.3 to 0.6%.

By this method I have found, after deduction of said ash, 13.75% glycerine in pure butter; 7% glycerine in oleomargarine.

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## DETERMINATION OF METALLIC ZINC IN ZINC DUST.

BY MORTON LIEBSCHÜTZ.

Fresenius has given a method based on the decomposition of acidulated water by the metallic zinc that is one of the constituents of zinc dust or tutty. The hydrogen evolved is converted in water, the weight of which answers to a definite amount of zinc. This method requires all the apparatus of an organic analysis; and although the results are accurate the daily increasing use of this zinc dust, requires that samples may be tested quickly, or compared one with the other, without loss of time and without necessitating costly manipulations.\* The following method will, I think, answer the purpose when a very close estimation is not required :

Weigh out about 1 grm. of the sample, after removing metallic iron with a magnet, moisten the sample, in a beaker, with alcohol; stir with a small platinum spatula, or a piece of platinum foil, and,

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\*The occlusion of hydrogen by zinc dust recently noted by G. Williams, adds a new difficulty in the use of Fresenius' process.