further series of experiments; and in the meanwhile invites others to do the same and to publish their results in this Journal.

METHOD OF DRYING SENSITIVE ORGANIC SUBSTANCES.[1]

By C. C. Parsons.

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SOME years ago in preparing formulas for a class of detergent compounds, of which soap was one of the ingredients, it was necessary, in order that the formula should be exact and definite, to ascertain the moisture in a great number of soaps, as commercial soaps differ greatly in this particular.

The usual processes described in analytical works were slow, and, unless very carefully conducted, were liable to cause decomposition of the soap by overheating.

Some previous experiments in dissolving soaps in mineral oils for increasing their viscosity and lubricating quality, suggested using an oil-bath, putting the soap directly into the hot oil, and weighing before and after the hot oil had driven off the moisture. It worked very satisfactorily, and subsequently was used with equally good results for drying wood paper pulp in some investigations in nitrating it for a smokeless powder.

The process has not been used extensively for commercial analysis, but in factory operations it has been used continually for some years, and could possibly be applied to drying many other substances.

In practice the best results have been obtained by using what is commercially called a straight paraffin oil, that is without any mixture of animal or vegetable oils or fats, or mineral substances, perfectly neutral, 0.920 specific gravity (22.5° B.), 435° flash test, 500° fire test, about 550° boiling-point. The object of a high fire test is that the oil will be so freed from volatile matter that none of it will be carried off with the moisture in the substance to be dried.

If many such analyses are required, it is advisable to prepare enough oil for several operations by heating it to about 250° for some time, and then keep it in a closed vessel, as it absorbs moisture from the air when exposed. A suitable amount of the sub-

[1] Read at the Meeting of the New York Section, March 5, 1897.

stance to be dried should be divided into small, thin pieces, then about six times its weight of oil put into an evaporating dish, and placed in a drying closet kept at 240°. When the oil has the temperature of the drying room, it should be weighed, and the substance to be dried, weighed and added to it. If very moist, add in successive portions. There will be a slight effervescence at first, and the whole should be kept in the drying closet for a few minutes after the effervescence has ceased.

Ordinarily the whole operation may be completed in twenty minutes. The evaporating dish containing the oil, and the substance, which is now perfectly dry, should be weighed; the loss, of course, is the moisture.

Substances like soaps, portions of which are dissolved in the oil, cannot be recovered, but those like wood pulp, none of the constituents of which are soluble in the oil, can be put in an extractor, and, after the oil is washed out, weighed again if desired.

The advantages of this process are, the quickness with which the operation may be carried out, simplicity of apparatus, ease of manipulation, and the fact that the substance to be dried is perfectly protected from any action of the air, by being immersed in a neutral liquid while heated, so that it will stand a higher temperature, without decomposition, insuring perfect dryness, than would be possible if exposed to the air.

THE VOLUMETRIC DETERMINATION OF LEAD.[1]

By J. H. WAINWRIGHT.

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HAVING been called upon some time ago to determine the percentage of metallic lead in a large number of samples of "white lead," "litharge," "red lead," etc., in a limited time, it became extremely desirable to find, if possible, some simple and rapid method, whereby twenty or thirty samples could be finished in a day. Extreme accuracy was not particularly necessary, since an error of two to three-tenths per cent. either way would not materially vitiate the results for the purpose for which they were required.

Various volumetric methods were examined, but they all with

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