

paper, between hot iron plates, the oil might be so far extracted as to allow of the application of the ordinary method of testing."

But such a process would be altogether too tedious, and I would suggest the following plan: If you have a sample of white lead ground in oil, and you wish to test it, it is not necessary to make a thoroughly accurate chemical analysis of it, all you want is the detection of one or more probable impurities, and these generally are sulphate of baryta, sulphate of lead, sulphate of lime (plaster paris), and carbonate of lime (chalk). The sulphate of baryta is almost universally employed in adulterating white lead; in fact, that is what it seems to be created for, and the manufacturer of white lead readily takes the advantage of the whiteness, the firmness, the weight, and, above all, the cheapness of sulphate of baryta; all it lacks is the opacity, commonly termed the body, for it does not cover well.

The way to proceed then, is as follows: Take a small precipitating bottle, weigh it, and introduce in it, a certain quantity of the white lead ground in oil. Then add about four times the quantity of ether, shake frequently till all oil is dissolved, decant and add another small quantity of ether, shake again, decant and repeat the operation till a few drops of the ether used will not stain a sheet of white paper on evaporating. Collect all the ether used, evaporate, and the oil is left as residue; weigh it and calculate the per centage of oil in the white lead. Now warm the bottle with the dry white lead in it, so as to eliminate all the ether, then weigh it, and the difference of weight before and after digestion with ether must be equivalent to the amount of oil extracted.

To the powder obtained, add a little nitric acid diluted with three times its volume of pure water. White lead being a basic carbonate of lead, its carbonic acid will be expelled, and nitrate of lead will be the compound in solution.

If no sediment remains, then only test for lime as follows:—Add ammonia in excess, which precipitates the oxide of lead, then decant and add a solution of carbonate of potassa, which precipitates the lime if present. This is dried and weighed, and the amount of carbonate of lime it represents is calculated as follows:

$$28 : 50 :: \text{weight of precipitate} : x$$

$$x = \text{weight of chalk.}$$

Or the solution may be treated with oxalate of ammonia, which precipitates the lime as oxalate of lime; this may be converted into a carbonate by ignition, and then weighed.

If, on the addition of diluted nitric acid, an insoluble residue is left, then this residue must be tested for the sulphates of baryta, of lead or of lime. Boil the residue with dilute hydrochloric acid; the sulphates of lead and of lime will be dissolved and the baryta left; this may then be dried and weighed. Precipitate the lead by adding ammonia and sulphide of ammonium, the sulphide of lead formed is treated with concentrated nitric acid, which converts it entirely into sulphate,