

This commits the chemist to no theory, but allows any one to recalculate the data according to conventional methods of individual preference. Such a plan has the advantage of presenting the combined nitrogen so as to permit immediate judgment as to the ratio between the different conditions, a point that is of especial advantage in tabulating comparative results.

Uniformity in methods of analysis is highly desirable, but it is difficult to secure the consent of all chemists to some processes. A partial benefit will be gained if the methods are indicated in some manner in the report.

Stated Meeting of May 18, 1897.

NOTES ON THE DETERMINATION OF INSOLUBLE PHOSPHORUS IN IRON ORES.

[ABSTRACT.]

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The authors referred to the greater necessity than formerly of determining the insoluble phosphorus in Bessemer iron ores, owing to the increasing demands for a lowering of the phosphorus content in what are considered standard Bessemer ores.

The usual method of fusing the insoluble residue with sodium carbonate has been found impracticable where a large number of determinations are to be made daily.

Experiments were instituted to devise a shorter method that would give accurate results.

The use of hydrofluoric acid to dissolve the siliceous residue from the acid treatment of the ore was found to be of no advantage as regards economy of time.

A mixture of ore and sodium carbonate subjected to a red heat (without producing a fusion) gave fair results with low silica ores, but was not adapted to high silica ores on account of the fusion of the mass.

Calcined magnesia mixed with the ore and ignited to a red heat (without fusion) extracted all the phosphorus, even with high siliceous ores.

Calcining the ore (without the admixture of any base) gave perfectly accurate results.

The calcination of the insoluble residue was just as satisfactory, so this treatment was adopted.

The details of the method are as follows: About $1\frac{1}{2}$ grams of ore are dissolved in a No. 3 beaker with 25 cubic centimeters of hydrochloric acid, 1.1 specific gravity. When the ore is dissolved the excess of acid is evaporated until the solution begins to assume a syrupy consistency. It is then diluted with water and filtered into an Erlenmeyer flask, and the filter-paper and residue are placed in a platinum crucible and ignited. When the paper is burned off the residue is broken up with a platinum rod and ignited at a red heat for several minutes, when it is removed and placed in a beaker for solution. Water is added, together with a few drops of hydrochloric or nitric acid, and the solution is brought to gentle boiling for about five minutes. It is then filtered into the flask containing the soluble phosphorus (or into another flask, in case it is to be determined separately*) neutralized with ammonia and precipitated as ammonium phospho-molybdate. The latter precipitate is titrated according to Handy's modification of the sodium hydroxide method.

[A table of analyses of some eighteen different ores was shown, in which the proposed method was checked up by the standard method.]

The conversion of the insoluble phosphorus into the soluble form, by simple ignition, is a matter of some theoretical interest. Possibly the method proposed by Berzelius for the decomposition of phosphates by means of silica may involve a reaction somewhat similar to it.

*It has been found that it is better to determine separately the soluble and insoluble phosphorus. Otherwise a too dilute solution is obtained for the precipitation.