

[A CONTRIBUTION FROM THE LABORATORY OF THE OMEGA PORTLAND CEMENT CO., JONESVILLE, MICH.]

A METHOD FOR THE RAPID GRAVIMETRIC ESTIMATION OF LIME.

By W. H. HESS.

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AN accurate gravimetric determination of lime in cement materials is very important as a check on the calcimeter. The method whereby lime is precipitated as the oxalate, ignited and weighed as the oxide, is both tedious and uncertain since prolonged ignition at a very high temperature is required to completely remove all the carbon dioxide.

The following method of estimation in which the lime is weighed as the sulphate has been found to be rapid and accurate.

The lime in the sample is precipitated and separated as the oxalate in the usual way, and the ignition is carried to the point of removing the filter from the residue of lime. The crucible is allowed to cool partially, when a portion of chemically pure dry ammonium nitrate, approximately equal in bulk to the lime in the crucible, and about twice as much chemically pure fused ammonium sulphate are added. A tight fitting cover is now placed on the platinum crucible and then gentle heat is applied. It has been found very convenient to incline the crucible at an angle of about 30° , allowing the tip of the crucible cover to project outward and then apply the flame to the tip of the cover, gradually bringing the flame under the crucible as the reaction grows less and less violent. The reaction is complete when fumes of ammonia salts are no longer driven off. Intense ignition is unnecessary and is to be avoided. The crucible should be weighed with its cover.

It was found that if ammonium sulphate alone was used, the transposition of carbonate to sulphate of lime was not always complete on first treatment. By the use of ammonium nitrate, easily fusible nitrate of lime is first formed, which is then completely transposed to the sulphate. The ammonium nitrate also helps to complete the ignition of the filter if any remains unburned.

Results on known samples of pure calcium carbonate are as follows :

Weight of CaCO ₃ taken. Grams.	Weight of CaCO ₃ recovered. Grams.
0.5003	0.4998
0.4997	0.4993
0.5012	0.5007
0.8472	0.8465
1.0037	1.0026

**ON A SYSTEM OF INDEXING CHEMICAL LITERATURE ;
ADOPTED BY THE CLASSIFICATION DIVISION
OF THE U. S. PATENT OFFICE.¹**

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IN the following paper I will endeavor to describe the system of indexing or digesting chemical literature and patents, now in use in the Classification Division of the United States Patent Office. This division was organized about a year ago to perfect the existing classification of United States patents. Under our laws, no valid patent can be granted for any new process, composition of matter, or chemical body, described in any printed publication prior to the inventor's discovery thereof, or more than two years prior to the date of his application for such patent ; and, among other things, this division is now preparing an index or digest of literature and patents relating to chemical bodies and processes, for the use of the office in making its examinations of pending applications.

The system adopted is in the nature of a reference index rather than a classification, and is one elaborated by myself, some five or more years since for another purpose, and on which we have been at work since last summer. I may add that our work was well advanced before my attention was called to the fact that there are great similarities between this system and that of Richter.

Generally speaking, in any comparison of digests or indexes that system may be considered best which, in the simplest, most certain, and most direct manner, puts the inquirer in possession of the desired information.

¹ Read before the Washington Section of the American Chemical Society, May 10, 1900.