

during the operation. This will give a deep purplish brown solution of cupric ferrocyanide which may precipitate partially on standing; but the precipitate so formed will be so fine that it will easily remain in suspension for a long time, upon shaking the bottle, thus insuring uniform composition. To find the correction for the indicator take 200 cc. of water, add 6-8 drops of ammonium hydroxide, then five cc. of indicator, taken after shaking the bottle well, and then run in potassium cyanide until the characteristic change of color is obtained.

Five cc. of cupric ferrocyanide of the above strength require from 0.15-0.2 cc. of potassium cyanide, one cc. of which is equivalent to 0.0025 of nickel. If a stronger end reaction is desired, ten cc. or even fifteen cc. of the indicator may be used and a suitable correction made.

Repeated analyses of steel have shown that the nickel may be determined, by the volumetric method, within from 0.0003 to 0.0005 gram of the true nickel content, duplicate determinations being made in three hours. The electrolytic method requires three hours to the time the solution is ready for electrolysis.

ANN ARBOR, MICHIGAN,
DECEMBER 7, 1893.

PRELIMINARY REPORT OF THE COMMITTEE ON THE TARIFF.

THE COLUMBIAN UNIVERSITY,

WASHINGTON, D. C., January 15, 1894.

H. W. Wiley, Ph.D., Etc., Etc.,

President American Chemical Society.

SIR:—Your favor of January 5, 1894, announcing the appointment of the Committee on the Tariff, with the undersigned as Chairman has been received, and while from the nature of the case, it has not been possible to call the committee together for action, steps have been taken to secure information upon which to base our action.

We learn that efforts are being made to try and settle the question "What are philosophical or scientific instruments and prepa-

rations?" and in this particular we would call attention to the fact that in 1884 the Secretary of the Treasury referred this very question to the National Academy of Sciences, and that the Committee appointed by that body reported that an instrument is "philosophical," not in consequence of its special construction or function, but in consequence of the uses to which it is to be put, and that many instruments may be put both to uses which are philosophical and to uses which are purely industrial or commercial, it therefore appears to this committee that the terms "philosophical apparatus and instruments" should be held to cover all such instruments and apparatus imported for the purpose of improving natural knowledge. (*Rept. Nat. Acad. Sci.*, 66-67; 1885.)

From inquiry thus far of officials familiar with the operation of our tariff laws it appears that the difficulty in securing for educational institutions the full advantage of paragraph 667, page 47 of the Tariff of October 1st, 1891, arises from the fact that if dutiable articles used in commerce or the industries be admitted duty free for educational institutions the door is thrown open for the evasion of the law by those not entitled to the benefit of the Act.

It has been suggested by experts that this difficulty might be surmounted and that educational institutions might obtain that relief which Congress evidently intended they should have, by substituting for the present statute one providing that educational and other favored institutions be granted a rebate of duties on all dutiable goods and material consumed by them. In this case goods would be purchased directly from the "stock on hand" of dealers, or by advanced orders as heretofore, and when delivered the invoices would be accompanied by authenticated statements of the duties paid, which amounts would be returned on presentation of the statement to the Secretary of the Treasury or to his authorized agent. It is claimed that by this plan the delays now incident to purchase, and the difficulties arising from inconsistent appraisement will be remedied.

Your committee would respectfully ask that any who are interested in this matter should send their views and suggestions to the chairman of the committee and especially that they should

supply him with the particulars of any instances of failure of the act or inconsistencies in appraisal which may have come personally to their notice.

Respectfully substituted,
 CHARLES E. MUNROE,
 Chairman.

EXPERIMENTS ON THE ESTIMATION OF GRAPHITE IN PIG METAL.

BY FRANK L. CROBAUGH.

Received December 19, 1893.

THE determination of graphite in pig iron is often required. At furnace laboratories there is rarely time and equipment necessary to do this work by combustion. Appended are some details of experiments made in the search for a simple, yet accurate, method. In all cases counterpoised two 9 cm. filters were folded together and the filtration performed upon them. After partial unfolding and drying at a temperature not exceeding 100° C., (higher temperature chars paper after treatment) the excess of weight of the inner paper will be the weight of the graphite or graphite plus impurities. If now the paper containing graphite plus impurities (chiefly silica) be burned and the residual weight subtracted from the excess of weight of the inner paper, the difference may be graphite. Five grams of the same drillings were taken for each operation.

The metal contained 1.68 per cent. silicon. The washing in every instance was first with water and hydrochloric acid 1.1 sp. gr. until all iron was removed. The last washings were invariably with water. When there was intermediate treatment on the filter, it will be described with the experiment. In duplicate experiments, A and B, 125 cc. nitric acid, 1.135 sp. gr. was used as solvent and continued at gentle heat for one hour.

	A	B
Weight graphite plus silica.....	0.2105	0.2500
Weight of residual silica.....	0.0255	0.0658
	<u>5)0.1850</u>	<u>5)0.1842</u>
	3.70	3.68