

## DETERMINATIONS BY PEMBERTON'S METHOD.

No. 1 used 1.0737 grams  $\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$  and 22.88 cubic centimeters KOH solution and 1.85 cubic centimeters acid.

No. 1 used 1.0370 grams  $\text{Na}_2\text{HPO}_4 + 12\text{H}_2\text{O}$  and 21.30 cubic centimeters KOH solution and 0.80 cubic centimeter acid.

No. 2 used 1.0000 gram Florida rock and 41.85 cubic centimeters KOH and 5.05 cubic centimeters acid.

No. 3 used 1.0000 gram Florida rock and 7.55 cubic centimeters KOH and 3.10 cubic centimeters acid.

No. 4 used 1.0000 Florida rock and 6.75 cubic centimeters KOH and 5.50 cubic centimeters acid.

Strength of  $\text{H}_2\text{SO}_4$  used 1 cubic centimeter = 0.015998 gram  $\text{H}_2\text{SO}_4$ .

Strength of potassium hydroxide solution 1 cubic centimeter = 0.01847 KOH.

The percentages of  $\text{P}_2\text{O}_5$ , calculated from the foregoing determinations, are :

Substance.	Gravimetric.	Pemberton.
No. 1, sodium hydrogen phosphate.....	19.72	19.73
No. 1, sodium hydrogen phosphate.....	19.78	19.99
No. 2, Florida rock.....	37.28	37.22
No. 3, Florida rock.....	4.40	4.53
No. 3, Florida rock.....	4.41	...
No. 4, Florida rock.....	1.45	1.32

It is evident from the above figures that the agreement between the results of the two methods is as close as could be desired. Inasmuch as the Pemberton method is of extreme accuracy, is very easily carried out and effects a great saving of time and labor over the official method, it is well worthy of extended use. We have found that the author's statement of the time required for a single determination, namely, thirty to forty minutes from the time the solution is measured out for titration, is entirely reasonable. Omitting filtration of silica makes no difference in the accuracy of the results.

SWARTHMORE COLLEGE, PA., February 20, 1894.

## THE CHEMICAL AND PHYSICAL EXAMINATION OF PORTLAND CEMENT.

(Continued from Page 273.)

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[TO BE CONTINUED.]

## INTERNATIONAL STANDARDS FOR THE ANALYSIS OF IRON AND STEEL.

### SUB-COMMITTEE ON METHODS.<sup>1</sup>

#### BULLETIN No. 2.

#### CIRCULAR TO IRON AND STEEL CHEMISTS ON METHOD OF DETERMINING PHOSPHORUS.

AT the World's Congress of Chemists in Chicago a Sub-Committee of the original Committee on International Standards for the Analysis of Iron and Steel was appointed to

<sup>1</sup> The Sub-Committee on Methods for the Analysis of Iron and Steel have sent the following bulletin to the iron and steel chemists of the country, so far as they could get their names. They earnestly request that any who do not receive a copy of the circular, but who do see this, will comply with the request of the bulletin, the same as though they had received a circular direct.