

full data are given for a series of determinations made with Ceylon graphite using kerosene as the liquid. The graphite was mostly in the form of a very fine powder, although many pieces as large as a grain of wheat were present. The kerosene had been dried by standing for three years over sodium shavings. The temperature of the liquid (about  $20^{\circ}$ ) did not change by  $0.5^{\circ}$  during the experiments. Ten grams of the graphite were added each time.

## READINGS ON PIPETTE.

Before solid was added. cc.	After solid was added.	After ten grams more solid was added.
9.92	5.67	1.42
9.90	5.67	1.44
9.91	5.64	1.43
<u>9.91</u>	<u>5.66</u>	<u>1.43</u>
Volume of ten grams of graphite.....		
		$\left\{ \begin{array}{l} 9.91 - 5.66 = 4.25 \\ 5.66 - 1.43 = 4.23 \end{array} \right.$
Density of graphite .....		
		$\left\{ \begin{array}{l} \frac{10.00}{4.15} = 2.35 \\ \frac{10.00}{4.23} = 2.36 \end{array} \right.$

The apparatus was taken apart, cleaned, dried and reassembled, and two more determinations made. The volumes found were 4.22 and 4.26, respectively, and the corresponding densities 2.37 and 2.34.

Of course, other dimensions than those given above for the apparatus may be taken. Also, if it is desirable to know the temperature exactly, a thermometer may be introduced directly into the liquid by using a three-hole stopper.

## THE SOLUBILITY, IN WATER, OF CERTAIN NATURAL SILICATES.

BY GEORGE STEIGER.

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IN this Journal for October, 1898, there is a preliminary paper upon this subject by Professor F. W. Clarke. The results shown in that paper were of such a character, that it was thought worth while to carry the investigation further, and an attempt has been made to show in what degree the different minerals are attacked by water after long standing.

The work was carried out as follows: One-half gram of each of the finely ground minerals was weighed out, and placed in a two ounce bottle with fifty cc. of water. These bottles were set aside where the temperature remained about 70° F. for one month, and were shaken from time to time. At the end of the period all were filtered, and the solutions were titrated with a standard hydrochloric acid solution, methyl-orange being used for an indicator.

What has gone into solution by this treatment I cannot say, sometimes soda, sometimes potash, possibly sometimes lime, but for the sake of comparison the results in the following table have been calculated in terms of  $\text{Na}_2\text{O}$ ; although the percentage of sodium is very small in some of the specimens. I have given also in another column, the percentage of the combined alkalis as shown by analysis of specimens from the same localities.

	Formula.	Per cent. of combined alkalis by analysis.	Equivalent of $\text{Na}_2\text{O}$ in solution.
Pectolite, Bergen Hill, N. J. ....	$\text{Ca}_2(\text{SiO}_3)_3\text{NaH}$	9.11	0.57
Muscovite. ....	$\text{Al}_3(\text{SiO}_4)_3\text{KH}_2$	10.00	0.32
Natrolite, New Jersey. ....	$\text{Al}_2(\text{SiO}_4)_3\text{Na}_2\text{H}_4$	15.79	0.30
Lintonite, Lake Superior. ....	$\text{Al}_6(\text{SiO}_4)_6(\text{CaNa}_2)_3 \cdot 7\text{H}_2\text{O}$	5.92	0.29
Phlogopite, Edwards, N. Y. ....	$\text{Al}(\text{SiO}_4)_3\text{Mg}_3\text{KH}_2$	9.32	0.22
Laumontite. ....	$\text{Al}_2\text{SiO}_4\text{Si}_3\text{O}_8\text{Ca} \cdot 4\text{H}_2\text{O}$	1.00	0.18
Lepidolite, Maine. ....	$\left\{ \begin{array}{l} \text{KHLiAl}_3(\text{SiO}_4)_3 \\ \text{K}_3\text{Li}_3(\text{AlF}_2)_3\text{Al}(\text{Si}_3\text{O}_8)_3 \end{array} \right\}$	13.00	0.18
Elæolite, Litchfield, Maine. ....	$\text{Al}_3(\text{SiO}_4)_3\text{Na}_3$	21.17	0.16
Heulandite, Nova Scotia. ....	$\text{Al}_6(\text{Si}_3\text{O}_8)_6(\text{CaNa}_2)_3 \cdot 16\text{H}_2\text{O}$	2.00	0.13
Orthoclase. ....	$\text{KAlSi}_3\text{O}_8$	16.00	0.11
Analcite. ....	$\text{NaAl}(\text{SiO}_3)_2 \cdot \text{H}_2\text{O}$	14.00	0.10
Oligoclase, Bakersville, N. C. ..	$\left\{ \begin{array}{l} \text{AlNaSi}_3\text{O}_8 \\ \text{Al}_2\text{CaSi}_4\text{O}_8 \end{array} \right\}$	9.18	0.09
Albite. ....	$\text{AlNaSi}_3\text{O}_8$	12.10	0.07
Wernerite, St Lawrence Co., N. Y	$\left\{ \begin{array}{l} \text{Ca}_4\text{Al}_6\text{Si}_8\text{O}_{25} \\ \text{Na}_4\text{Al}_3\text{Si}_9\text{O}_{24}\text{Cl} \end{array} \right\}$	11.09	0.07
Leucite, Vesuvius, Italy. ....	$\text{KAl}(\text{SiO}_3)_2$	21.39	0.06
Stilbite, Nova Scotia. ....	$\text{Al}_2(\text{Si}_3\text{O}_8)_2(\text{CaNa}_2) \cdot 6\text{H}_2\text{O}$	1.00	0.05
Chabazite, " " ....	$\text{Al}_2\text{SiO}_4\text{Si}_3\text{O}_8(\text{CaNa}_2) \cdot 6\text{H}_2\text{O}$	7.10	0.05

It is worth noting in comparing the depth of color produced by phenolphthalein solution, as shown in Professor Clarke's

paper, with the percentage of alkali in solution as shown in this work, that some of the minerals which give a deep coloration with the former, show in the above table a comparatively small amount of alkali in solution, and *vice versa*. Muscovite for example while giving only a faint coloration with phenolphthalein, contained in solution alkaline compounds equivalent to 0.49 per cent.  $K_2O$ ; pectolite, with 0.57 per cent.  $Na_2O$ , being the only one of the series showing a larger amount.

I hope in the near future to be able to carry this investigation further.

LABORATORY OF THE U. S. GEOL. SURVEY,  
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[CONTRIBUTION FROM THE HAVEMEYER LABORATORIES OF COLUMBIA  
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## A METHOD OF ANALYSIS FOR CANNED CONDENSED MILK.<sup>1</sup>

BY F. S. HYDE.

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BEFORE proceeding with the analysis, it may be desirable to ascertain the approximate specific gravity of the sample as follows:

Weigh the can with its contents. Then remove contents, replace with water to the top, and weigh again. Weigh empty can (sufficiently dried) and ascertain weights of milk and water separately. Divide the weight of condensed milk by the weight of water as a standard, and the quotient is the specific gravity of the condensed milk (near enough for practical purposes).

The specific gravity, which is not a matter of great importance, may vary from 1.27 to 1.37, according to the quantity of cane-sugar added, or according to the relative amounts of fat and albuminoid material in the milk used for condensation. That is, milk deficient in fat may show an increment in gravity irrespective of the amount of sugar added.

As to the method of analysis: the contents of the can, together with any portions of crystallized sugar, which may adhere to the bottom of the can like a hard mealy mass, are transferred to a beaker and stirred vigorously until the mass

<sup>1</sup>Read before the New York Section of the American Chemical Society, February 10, 1899.