

fore, characteristic of the sample. It represents, in effect, the rate of change of decomposition velocity with change of temperature, and as such is an index of the stability of the powder.

Inspection of the curves shows that for stable powders there is a pronounced bend, while the ratio of explosion periods at  $200^{\circ}$  C. and  $160^{\circ}$  C. is at least 2:9. In the unstable powders this ratio falls as low as 2:3 and the irregularities become greater. It also becomes evident that one explosion temperature, even if time is considered, does not give much information.

It is possible that with sufficient accumulated data the test may throw some light on the actual effect of a stabilizer on the natural decomposition velocity of powders.

A short résumé of the literature on stability tests is given.

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### THE ATOMIC WEIGHT OF BROMINE.<sup>1</sup>

By H. C. P. Weber.

THE National Bureau of Standards has just sent to press the results of the work of H. C. P. Weber on "A New Determination of Atomic Weight of Bromine." A considerable amount of work has been done in order to determine the atomic weight of bromine, and the oft-repeated comparison of the atomic weights of silver and bromine makes it seem that this ratio is known with considerable accuracy. The value accepted for bromine, however, rests almost entirely upon that of silver, and it is of interest and importance to obtain a ratio between it and some other element. For chlorine a number of determinations of the ratio of hydrogen to chlorine in hydrochloric acid have been made, both by purely physical and by chemical methods. For bromine similar comparisons have not been made. Since the determination of the ratio chlorine:hydrogen was carried out with reasonable ease it seemed probable that the method might be advantageously applied for the purpose of determining the ratio between hydrogen and bromine.

The ratio of the atomic weights of hydrogen and of bromine is obtained by determining the amount of bromine which a weighed quantity of hydrogen will remove from potassium brom-

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<sup>1</sup> Abstract of forthcoming scientific paper to appear in vol. 9 of the Bulletin of the Bureau of Standards.

platinate. The hydrobromic acid formed is also weighed. From ten determinations twenty values are obtained giving the ratio H:Br equal to 1:79.306<sup>8</sup> with a probable error of  $\pm .0014$ . Taking the atomic weight of hydrogen as 1.00779 (O=16) the atomic weight of bromine is 79.924.

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### THE TESTING AND PROPERTIES OF ELECTRIC CONDENSERS.<sup>1</sup>

IN the testing of condensers over a period of years much information has been collected, only a part of which is at present available to the public. Also, a large amount of work has been done elsewhere, which has appeared in various publications. It is the purpose of this circular to collect together the important facts concerning condensers and to present them as a connected whole. The different kinds of condensers are described, their properties discussed, and the most satisfactory methods of testing indicated.

On account of their importance as standards, mica condensers are treated at considerable length. The effect of absorption on the phase angle and effective capacity is discussed in considerable detail, and many results are given showing the values that may be expected for good mica condensers. Also, a standard method of test is indicated.

Paper condensers are similar in their behavior to mica condensers, but the effect of absorption is much more marked. Also, in some paper condensers the resistance of the plates affects the phase angle in a very pronounced manner. Results on a number of commercial condensers are given.

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### A TUBULAR ELECTRODYNAMOMETER FOR HEAVY CURRENTS.<sup>2</sup>

By P. G. Agnew.

THE field "coil" of the instrument consists of two coaxial copper tubes, thus giving a circular magnetic field in the space between the tubes. On direct current the distribution of the current is assumed to be uniform over the cross section of the tubes, but on alternating current, as is well known, the current

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<sup>1</sup> Abstract of Circular of the Bureau of Standards, No. 36, 1912.

<sup>2</sup> Abstract of paper to appear in the Bulletin of the Bureau of Standards, vol. 9.