siderations above enumerated it would seem worth while to calculate a new table making use of the values as indicated.

A summary of the factors entering into the calculation is as follows:

Observed weight of 1 liter CO_2 at 0° and 760 mm. Guye—Lat. 45° (*J. chim. phys.*, April, 1907), 1.9768.

Corrected value for CO_2; Lat. 41°, elevation 100 meters. 1.9768 × 0.9996007; 1.9760.

Coefficient of expansion for CO_2. Constant volume—Chappuis 1903, 0.0037135.

Formula used:

$$V = \frac{v\,(P - w - b)}{760\,(1 + 0.0037135 \times t)},$$

in which P is the observed pressure; (w) is the correction for tension of aqueous vapor; (b) correction for barometer, glass scale.

Hence the formula for W (weight) of 1 liter observed volume reduced to 0° and 760 mm. would be

$$W = \frac{1.976\,(P - w - b)}{760\,(1 + 0.0037135 \times t)}.$$

The accompanying table has been calculated on this basis.

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THE NON-EXISTENCE OF TELLURIUM OXYCHLORIDE.

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According to Ditte[1] when $TeO_2 2HCl$ is heated above 300°, decomposition ensues with the formation of tellurium oxychloride and water, thus: $TeO_2 2HCl = TeOCl_2 + H_2O$.

This statement has been carried through the literature without modification and the oxychloride is described as light brown leaflets which melt to a dark liquid and which dissociate easily giving volatile tellurium chloride and a residue of dioxide.

That such a compound as $TeOCl_2$ should exist might be deduced from its analogues $SOCl_2$ and $SeOCl_2$. The latter, oxychloride of selenium, is readily prepared by heating molecular proportions of selenium dioxide with the tetrachloride. When tellurium dioxide is heated with tellurium tetrachloride no definite compound is produced. Indeed carefully conducted experiments have shown us that when equal parts of tetrachloride and dioxide are heated in carbon dioxide, the dioxide remains non-volatile and is practically chlorine-free while the chloride volatilizes. When tellurium tetrachloride is heated alone in the air it gradually loses chlorine and is finally converted into the dioxide, which is chlorine-free.

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[1] *Compt. rend.*, **83**, 336.

The work of Ditte on the formation of volatile products when tellurium dioxide is brought in contact with gaseous hydrochloric acid at various temperatures has been repeated and the results confirmed. Our experiments have led us to conclude that fused tellurium dioxide unites with hydrogen chloride at temperatures approximating zero up to 200° and even above this temperature.

At 280–300°, tellurium dioxide is completely volatile in hydrogen chloride gas, the products of the reaction as shown by analysis being tellurium tetrachloride and water. That is to say, the composition of the products formed by the action of hydrogen chloride gas on tellurium dioxide are dependent on the temperature at which the reaction takes place.

At temperatures close to zero one molecule of tellurium dioxide unites with three molecules of hydrogen chloride and on raising the temperature one of the three molecules of hydrogen chloride is expelled with the formation of the volatile compound TeO_22HCl. On further heating to 280–300°, $TeCl_4$ is produced.

The action of heat on TeO_22HCl, according to Ditte, should take place thus: $TeO_22HCl = TeOCl_2 + H_2O$; actual observation has shown that when this experiment is carried out the chloride and dioxide are formed with no intermediate formation of oxychloride.

When the dioxide and tetrachloride are heated together in a sealed tube under pressure the chloride first melts, and when the temperature is raised sufficiently high the dioxide melts; elevation of the temperature causes both to gasify. On cooling, we find a separation into two distinct layers, the lower one consists of dioxide, while the upper consists of chloride. Under diminished pressure, when a mixture of chloride and dioxide are heated together, it is possible to boil off the chloride from the mixture leaving the dioxide as an unfused residue.

From the above experiment it would seem that tellurium oxychloride cannot be prepared by the common means at our disposal for the preparation of such substances and it may be recalled that in the action of various reagents on tellurium and its dioxide[1] and in studies on various halides[2] no compounds have been observed of the type of an oxyhalide.

The author hereby desires to acknowledge his indebtedness to Dr. R. D. Hall and Mr. E. J. Rathjen for aid in obtaining various experimental data.

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[1] THIS JOURNAL, **30**, 737.

[2] *Ibid.*, **22**, 136 and **25**, 730.