safely used in the estimation of phosphates in the presence of the above salts.

Salt.	Parts per million.	Concentration, normal.
Sodium sulphate, decahydrate	500	0.003
Potassium nitrate	1000	0.01
Magnesium sulphate (hydrate)	1000	0.008
Potassium hydrogen sulphate	1500	0.02
Calcium nitrate	2000	0.025
Magnesium nitrate	2000	0.03
Sodium chloride	2000	0.035
Potassium ethyl sulphate	3000	0.035
Sodium nitrate	5000	0.06

The results here presented supplement the work of Veitch[1] who showed that ammonium salts, and certain chlorides influenced the color of phosphomolybdate solutions. The data make evident the limitations of this colorimetric method. The oxidation of organic matter with magnesium nitrate, the method recommended by Wiley,[2] introduces relatively small errors in the estimation of phosphates by this colorimetric method, for it will be noted, that a considerable quantity of this reagent may be present within certain limits without influencing appreciably the intensity of color. Some experiments have been conducted with meat samples in which the material was completely oxidized by electrolytic oxygen and oxides of nitrogen obtained in the electrolysis of concentrated nitric acid. These preliminary experiments indicate that the colorimetric method can then probably be applied with success, provided the final concentration of acid is made the same as in the solution of standard phosphate used in the comparisons. Work on the details of this operation are in progress.

This work was undertaken at the suggestion of Dr. Herman Schlundt. I here wish to express my sincere thanks for his kind interest and the assistance he has given me in my work.

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NOTES.

On the Procedure for the Oxidation of Chromic Acid to Perchromic Acid.—In the identification of chromium by the oxidation of chromic acid to perchromic acid many, if not all, authors state that the solution should *first* be acidified with some acid, preferably dilute sulphuric acid, then shaken with an excess of ether, and finally a little hydrogen peroxide added and the whole shaken again so that the perchromic acid formed may be dissolved in the ether to give a blue color. This method of procedure sometimes proves troublesome, except under certain con-

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[1] Veitch, *Loc. cit.*

[2] Wiley, "Agricultural Analysis" (1906), Vol. I, p. 587.

ditions, in that the reduction of the perchromic acid to a chromic salt is so rapid that one often fails altogether to get the blue color of the perchromic acid. It does not seem to be well known that if the hydrogen peroxide is *first* added and thoroughly mixed with the neutral or alkaline chromate solution (made alkaline, if necessary, by the addition of caustic soda or potash but not ammonium hydroxide) and the solution *then* acidified with some dilute acid (preferably dilute sulphuric or nitric but not hydrochloric acid) that the method practically never fails to give a good blue color even when *no* ether is used. In fact, the ether is entirely unnecessary except for traces of chromium. W. J. KARSLAKE.

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Effect of Water on the Freezing Point of Molten $CaCl_2.6H_2O$.—Mr. G. Cock[1] has recently called attention to an error in the calculation of the molecular weight of water in molten $CaCl_2.6H_2O$ by the Richards method as given on page 1172 of Morgan and Benson's paper, "Molten Hydrated Salts as Solvents for the Freezing Point Method,"[2] which raises the apparently normal value to that same, abnormal, one derived from the Beckmann method. How this error arose it is impossible now to say, but apparently these results were the only ones that were not checked several times after the original calculation.

The peculiarity of the results as originally given by Morgan and Benson was that while the Beckmann method gave an abnormal molecular weight for added water, the Richards method gave nearly a normal one. Although at the time, little attention was paid to this, the behavior of water being discussed in only a few lines, and not included in the summary of results, it was intended to make it the subject of a later investigation. Such an investigation, of course, would have brought to light the error which Mr. Cock has discovered, but a press of other work has up to the present time prevented even the beginning of it.

By thermodynamical reasoning[3] it can be proven that the addition of either water or anhydrous calcium chloride to molten $CaCl_2.6H_2O$ *must* produce an abnormally small depression of the freezing point of that solvent, and consequently will lead to an abnormally large molecular weight of the added substance. Hence, now that attention has been called to this error, it is evident that both the Beckmann and Richards methods lead to the same conclusion as that obtained by the theoretical consideration of the subject.

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[1] *Z. anorg. Chem.*, 60, 191–2 (1908).

[2] THIS JOURNAL, 29, 1168–75 (1907).

[3] van't Hoff, "Lectures on Theoretical and Physical Chemistry," English translation, Vol. 1, p. 72 (1898); and also Lewis, *Proc. Am. Acad. of Arts and Sciences*, **43**, 287 (1907).