7. The change in salt effects for a P_H range from 3.97 to 12.55 was determined. Specific salt effects over the secondary hydrogen ion change only become important in the extreme range of P_H values.

WASHINGTON, D. C.

NOTES

The Atomic Weight of Chlorine. The Solubility of Silver Chloride.—I am grateful to Messrs. Scott and Johnson[1] for calling my attention to an erroneous statement in the paper by Hönigschmid and Chan[2] on the atomic weight of chlorine.

Our reason for deciding that it was unnecessary to apply a correction for the silver chloride removed in making the nephelometric tests, when the precipitate was subsequently to be weighed, was that we had assumed its solubility under the conditions of the analysis at 0° to be 0.05 mg. per liter. At that time we had not determined this value ourselves but, through an error in reading, had taken from the paper by Richards and Willard[3] this value instead of the true one, 0.5 mg. per liter. After reading the communication of Scott and Johnson, we determined this solubility in analyses both of sodium and potassium chlorides at the equivalence point, after the usual shaking and cooling in ice for several days. Portions of the perfectly clear solution were pipetted into nephelometer tubes and, after addition of silver and chloride ion, respectively, showed the same opalescence as a standard containing 0.53 mg. of silver chloride per liter, thus completely confirming the work of Richards and Willard. When an excess of 0.3 mg. of silver was added, the solubility was 0.42 mg. or only 80% as much. This common ion effect makes the correction uncertain.

The nature of the precipitate obtained by us was probably different from that obtained by Scott and Johnson, and this doubtless accounts for the lower solubility found by us. In making the correction we prefer to use our own value because we consider it more applicable.

A calculation of the correction to be applied was easily made by referring to the laboratory notebook which contained all the data. Usually only two or three tests were necessary, because the proper amount of silver was carefully weighed to within 0.1 or 0.2 mg. It was assumed that 100 cc. of the solution contained 0.05 mg. of silver chloride, as already determined, because although it may have been less in the first test, when an excess of one ion was present, this value is certainly a maximum. Each nephelometer tube contained 22 cc. The corrections are shown in Table I.

[1] Scott and Johnson, THIS JOURNAL, **52**, 3586 (1930).

[2] Hönigschmid and Chan, *Z. anorg. allgem. Chem.*, **163**, 315 (1927).

[3] Richards and Willard. THIS JOURNAL, **32**, 4 (1910).

TABLE I

CORRECTION VALUES

No.	No. of nephs tests	Vol. of soln. removed, cc.	AgCl in soln., mg.	Corr. wt. AgCl in vac., g.
1	2	88	0.044	11.54010
2	2	88	.044	9.11889
4	3	132	.066	9.94704
5	4	176	.088	13.58106
6	4	176	.088	11.96637
7	3	132	.066	8.94863
8	3	132	.066	12.30290
9	3	132	.066	8.80133

In Table II are shown the corrected gravimetric values for the atomic weight of chlorine, together with the weights of silver plus chlorine taken and found.

TABLE II

THE ATOMIC WEIGHT OF CHLORINE

No.	Wt. of Cl in vac., g.	Wt. Ag in vac., g.	Wt. AgCl in vac., g.	Diff., mg.	Cl:AgCl	At. wt., Cl
1	2.85458	9.68543	11.54010	−0.09	0.2473618	35.4558
2	2.25569	6.86312	9.11889	− .08	.2473645	35.4563
4	2.46049	7.48635	9.94704	− .20	.2473590	35.4553
5	3.35955	10.22139	13.58106	− .12	.2473702	35.4574
6	2.96007	9.00620	11.96637	− .10	.2473657	35.4565
7	2.21357	6.73502	8.94863	− .04	.2473641	35.4562
8	3.04333	9.25949	12.30290	− .08	.2473669	35.4568
9	2.17711	6.62409	8.80133	− .13	.2473615	35.4558
	21.32439	64.88109	86.20632	− .84	.2473646	35.4563

The average value for the atomic weight of chlorine is 35.4563, and that obtained nephelometrically is 35.4567. The average deviation between the weight of silver chloride found and calculated is 0.10 mg. and the total for eight gravimetric determinations is 0.84 mg.

Because silver chloride retains traces of other salts, it is probable that the weight obtained in the gravimetric process tends to be too great and that an exact agreement between the gravimetric and volumetric methods, if it occurs, is due to a chance compensation of errors in both directions.

In most of our atomic weight determinations the error due to uncertainty in the amount of silver chloride removed for nephelometric tests is, as shown above, very small, because the solution is almost always so near the equivalence point that very few tests are necessary.

CONTRIBUTION FROM THE
CHEMISCHES LABORATORIUM DER BAYER
AKADEMIE DER WISSENSCHAFTEN
MÜNCHEN

O. HÖNIGSCHMID

RECEIVED FEBRUARY 28, 1931
PUBLISHED AUGUST 5, 1931