

Summary

The name alabamine and symbol Am have been suggested for element 85.

A concentrate containing 2.5×10^{-6} g. of alabamine in the form of lithium alabamide has been prepared.

Minima have been determined for the oxygen halogen compounds.

Alabamides are easily oxidized forming hypoalabamites, alabamites, alabamates and peralabamates and their corresponding acids. Peralabamates are the most stable of these compounds.

The atomic weight of alabamine is estimated at 221.

AUBURN, ALABAMA

NOTES

Iodine Monochloride in Hydrochloric Acid Solution.—Recently¹ the contention has been made that iodine monochloride in aqueous solutions exists as I^+ and Cl^- because iodine is more soluble in hydrochloric acid containing iodine monochloride than in the pure acid. This difference might be attributed to the increased similarity between solvent and solute, although Philbrick's view is in agreement with Abel and Halla's² interpretation of Sullivan's³ potential observations. However, Forbes, Glass and Fuoss⁴ have already pointed out the difficulties of reconciling such ionization with a mathematical analysis of titration curves in these solutions, and concluded that the ion ICl_2^- must predominate, in agreement with Schützenberger.⁵ Philbrick fails to recognize that slow hydrolysis of iodine monochloride in aqueous salt solutions, rather than ionization, better explains the slowly increasing conductance and freezing point depression observed by Sullivan³ in freshly prepared solutions.

We have subjected these opposing views to crucial experiments. The specific conductance of an approximately one normal solution of hydrochloric acid was measured at 25° in an oil-thermostated cell, using the accurate bridge of Grinnell Jones, and found to be 0.32405 mho per cm. On adding iodine monochloride to make the solution 0.14 molal in respect to ICl , the specific conductance decreased to 0.32229 mho. This experiment proves conclusively that iodine monochloride cannot exist appreciably in the ionized state in this solution.

A transference experiment was devised to observe the direction of

¹ Philbrick, *J. Chem. Soc.*, 2254 (1930).

² Abegg, "Handbuch der anorganischen Chemie," 1913, IV², p. 472.

³ Sullivan, *Z. physik. Chem.*, **28**, 523 (1899).

⁴ Forbes, Glass and Fuoss, *THIS JOURNAL*, **47**, 2892 (1925); Forbes and Fuoss, *ibid.*, **49**, 142 (1927).

⁵ Schützenberger, *Compt. rend.*, **84**, 389 (1877).

migration of the iodine during electrolysis. If iodine occurs as I^+ it should migrate to the cathode; if it occurs as ICl_2^- it should migrate to the anode. A solution 4 *N* in hydrochloric acid and 1.6 *m* in iodine monochloride was introduced in the apparatus shown in the figure. The beakers surrounding the stopcocks contained pure hydrochloric acid. After passing 15 milliamperes through the closed stopcocks for several hours, the anode beaker, B_1 , had a strong yellow color, while the cathode beaker, B_2 , was colorless. Portions from both beakers were reduced with sodium bisulfite and tested for iodine with starch and chlorine water. Iodine in large amount was invariably found in the anode beaker. The test on the cathode beaker showed no trace of iodine. To show that this was not due to leakage of ICl into the anode beaker, we used fresh acid and reversed the current; again iodine was found in the anode beaker and none in the cathode beaker.

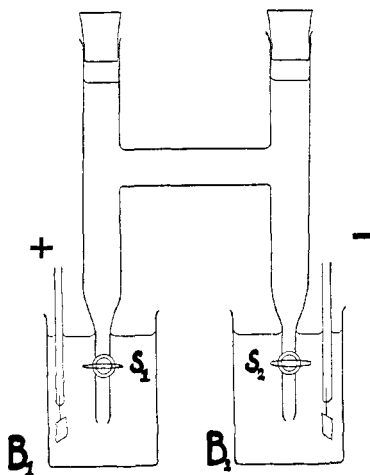


Fig. 1.

We believe that these experiments furnish strong additional evidence that the ion I^+ is present in negligible concentration, if at all, and that iodine monochloride forms extensively a negative complex ion with chloride ion.

CONTRIBUTION FROM THE
CHEMICAL LABORATORY OF
HARVARD UNIVERSITY
CAMBRIDGE, MASSACHUSETTS
RECEIVED AUGUST 17, 1931
PUBLISHED FEBRUARY 5, 1932

J. HORACE FAULL, JR.
SVEN BÆCKSTRÖM

The Preparation of Germanium Tetrabromide and Germanium Tetraiodide

Germanium Tetrabromide.—The only method which has been described for preparing germanium tetrabromide involves the action of bromine vapor on heated metallic germanium.¹ This procedure is laborious since it requires the preliminary preparation of elementary germanium. By modifying the method which Tabern, Orndorff and Dennis² used for the preparation of germanium tetrachloride it was found possible to obtain germanium tetrabromide directly from germanium dioxide and hydrobromic acid.

¹ Dennis and Hance, *THIS JOURNAL*, **44**, 299–307 (1922).

² Tabern, Orndorff and Dennis, *ibid.*, **47**, 2039 (1925).