NOTES

The Effect of Aluminum Chloride and Antimony Trichloride on the Solubility of Cesium Antimony Chloride in Hydrochloric Acid Solutions

By Paul Bender and Robert E. Bunde

The precipitation of cesium antimony chloride is often carried out in the presence of aluminum chloride, and an excess of antimony trichloride is employed in any case. The effects of these reagents on the solubility of the double salt in hydrochloric acid solutions are reported in Tables I and II. The accuracy of the data of Table I is estimated as 0.3%, for that of Table II, 1%. For pure hydrochloric acid solutions the solubilities here given are in good agreement with those previously published.[1]

Table I

Effect of Aluminum Chloride on the Solubility of Cesium Antimony Chloride in Hydrochloric Acid Solutions at 25°

m HCl	m $AlCl_3$	G. salt/100 g. solution	G. salt/100 cc. solution
2.988	0.000	1.381	1.457
	0.48	1.143	1.263
	0.89	1.036	1.189
	1.33	0.960	1.144
	1.77	0.901	1.110
3.529	0.000	1.275	1.354
	0.48	1.099	1.224
	0.96	0.992	1.152
	1.43	0.918	1.110
	1.91	0.860	1.077
4.446	0.000	1.194	1.280
	0.47	1.088	1.223
	0.96	0.998	1.171
	1.39	0.947	1.155
	1.43		1.142
6.268	0.000	1.120	1.228
	0.50	1.054	1.212
	0.73	1.015	1.192
	1.02	0.982	1.184
10.75	0.000	1.072	1.225
	0.17	1.083	1.261
	0.26	1.089	1.278
	0.29	1.094	1.286

Experimental

Preparation of Materials.—Cesium antimony chloride free from thallium[1] was synthesized from reagent grade antimony trichloride and cesium chloride prepared by the method of Wells.[2] Other reagents employed were of analytical grade.

Solubility Measurements.—Standard procedures were followed in the solubility determinations. The thermostat temperature was maintained at 25.00 ± 0.02°; the thermometer was calibrated before use. Weld specific gravity bottles were used in the density determinations required for conversion of the results to the volume concentration basis. Calibrated weights and glassware were used throughout the work.

Table II

Effect of Antimony Trichloride on the Solubility of Cesium Antimony Chloride in Hydrochloric Acid Solutions at 25°

m HCl	m $SbCl_3$	G. salt/100 g. solution	G. salt/100 cc. solution
6.718	0.000	1.104	1.218
	.00863	0.985	1.085
	.01250	.925	1.020
	.01707	.890	0.980
	.02205	.840	.925
	.03168	.760	.840
	.04487	.680	.750
	.06594	.580	.645
	.09830	.485	.540
	.1966	.365	.410
12.11	.000	1.075	1.245
	.01550	0.940	1.090
	.02760	.835	0.965
	.05545	.675	.785
	.1108	.495	.575

Analytical Methods.—Samples of the saturated solutions were transferred to weighing flasks by air pressure; glass wool plugs were used as filters in the delivery tubes. The solutions were analyzed by volumetric determination of the antimony present by iodometric titration; when an excess of antimony trichloride was present this procedure was checked by removal of antimony as the sulfide and weighing the residual cesium chloride. The hydrochloric acid solutions were standardized gravimetrically by means of silver chloride. Aluminum chloride solutions were made up by weight from the anhydrous salt. Solvent solutions containing an excess of antimony trichloride were prepared by weight from hydrochloric acid and either antimony trioxide or freshly distilled antimony trichloride.

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[1] P. Bender, This Journal, **67**, 1771 (1945).

[2] H. L. Wells, *Am. Chem. J.*, **26**, 265 (1901).

The Absorption Spectrum of Iodine in Acetone

By H. A. Benesi and J. H. Hildebrand

In an earlier publication[1] we briefly reported that the absorption spectrum of iodine in pure acetone was characterized by a single, intense absorption peak, $\epsilon_{\text{max.}} = 6100$ at 363 mμ. The absorption was reproducible, and remained unchanged for several hours, but noticeably decreased during a two- or three-day period. In view of this evidence we had tacitly assumed that the normal absorption peak of iodine ($\epsilon_{\text{max.}} = 1000$ at 520 mμ) had been shifted into the ultraviolet region in its acetone solutions because of some form of solvent interaction, like that between

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[1] H. A. Benesi and J. H. Hildebrand, This Journal, **71**, 2703 (1949).