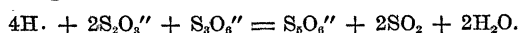


Pentathionate, with sulphite, accompanies As_2S_5 along the horizontal lines.



Specific heat determinations with an adiabatic calorimeter: FARRINGTON DANIELS and CHARLES B. HURD.

The partition of metallic radicals between a salt phase and an alloy phase: HERBERT F. SILL.

The retention of bromine by silicic acid gel: W. A. PATRICK and E. L. RYERSON.

Determination of the viscosity of pyroxylin solutions: E. F. HIGGINS and E. C. PITMAN.

A slide rule for special cases: F. C. BLAKE.

Adsorption by precipitates. (II.), the adsorption of anions by hydrous ferric oxide: HARRY B. WEISER and EDMUND B. MIDDLETON.

The physical character of hydrous ferric oxide: HARRY B. WEISER.

Flame reactions of selenium and tellurium: HARRY B. WEISER and ALLEN GARRISON.

The catalyst in the oxidation of ammonia: G. A. PERLEY.

Equilibria in the systems: carbon disulfide, methyl alcohol and carbon disulfide, ethyl alcohol: E. C. MCKELVY and D. H. SIMPSON. The mutual solubility relations of the two pairs of liquids were determined over practically the whole range of concentrations paying particular attention to the purity of the materials used. The following values were obtained for the critical solution temperature and the critical concentration: for methyl alcohol—carbon disulfide $+35.7^\circ$, 84.7 per cent. CS_2 ; for ethyl alcohol—carbon disulfide -24.4° , 82.7 per cent. CS_2 ; applications to the determination of small quantities of water in the alcohols and the analysis of anhydrous methyl and ethyl alcohol mixtures were pointed out.

Notes on the estimation of nitrates and nitrites in battery acids: LILY BELL SEFTON.

A metal to glass joint and some of its applications: E. C. MCKELVY and C. S. TAYLOR.

Fluorides of cobalt, nickel, manganese and copper: F. H. EDMISTER and H. C. COOPER. The fluorides of cobalt, nickel, manganese and copper can be prepared by dissolving the hydroxide or the carbonate of the metal in hydrofluoric acid, the same product being obtained, whichever is used. In all cases a crust-like product was obtained. By recrystallizing from water, slightly acidulated with hydrofluoric acid, crystals of the acid fluorides were formed and analyses and measurements of these crystals were made. The analyses indi-

cated that these salts all form an isomorphous series but the crystallographic measurements showed that only the cobalt, nickel and manganese salts are isomorphous, while the copper salt belongs to a different system. The formulas of all four fluorides are of the same acid fluoride type: $\text{MF}_2 \cdot 5\text{HF} \cdot 6\text{H}_2\text{O}$. It was surprising to obtain the acid fluoride by recrystallization from water, a basic salt being expected under these conditions. These acid fluorides are not permanent in the air but decompose, losing hydrogen fluoride and, in the case of copper, losing water also, so that the crystals used for analyses must be carefully selected. The formation of a hydrated, non-crystallized crust is distinct from that of the hydrated acid fluoride crystals. In this crust the ratio of metal to fluorine, for the cases of cobalt and nickel, was found to be about one to two, with varying water content. This crust differs from the crystals in solubility and form, as well as in composition. We have arrived at the conclusion that the crust described by Berzelius as containing two molecules of water, the crust later described by Clarke as containing three molecules of water, and the crust and powder obtained by us are the same, the water content being variable and the crystal form being undeveloped. All were obtained in the same manner.

The determination of mercury: H. B. GORDON.

The preparation and uses of TiCl_3 solution: F. L. ENGLISH and H. S. TANNER.

Contrasting effects of sulfates and chlorides on the hydrogen ion concentration in acid solutions: A. W. THOMAS and M. E. BALDWIN.

Chromophor tautomerism in indicators: WILLIAM C. ARSEM.

CHARLES L. PARSONS,

Secretary

(To be continued)

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