

solubility is critically discussed. It is shown that: (a) for a *fixed* solute in a series of *different* solvents, increasing solubility and increasing compound formation proceed in parallel; (b) for a series of *different* solutes of high melting-point in a *fixed* solvent, solubility and compound formation also proceed in parallel at low temperatures. Salts of a very weak base exhibit increasing hydrate formation and increasing solubility in water as the acid radical X diverges from OH; salts of a very weak acid show the same behavior as R diverges from H. The increase in the solubility of a difficultly soluble salt in water on addition of a second salt containing a common ion, due to complex salt formation, is dependent upon the diversity of the variable radicals. The extension of these rules to non-aqueous solutions and their importance in analytical chemistry are noted.

The complete analysis of an insoluble silicate with a single fusion: F. P. DUNNINGTON. Fuse the powdered silicate with six parts of lithium carbonate in a gold crucible. The melt is dissolved in dilute acid, evaporated, heated and the silica separated as usual. To the solution of chlorides add ammonia, etc. To remove alumina, iron and manganese, precipitate lime as oxalate; magnesia by ammonium phosphate and then, with little calcium chloride and ammonium carbonate remove all excess of phosphoric oxide; evaporate filtrate, volatilize ammonium salts. The residue is digested in a mixture of absolute alcohol and ether, which readily dissolves the lithium chloride; filter off the potassium and sodium chlorides, weigh and separate them.

Alizarine-iron lakes: A. W. BULL AND J. R. ADAMS.

Adsorption of tannin by gelatine: A. W. BULL AND J. R. ADAMS.

The theory of molecular-compound formation: V. R. KOKATNUR AND H. W. STIEGLER. This theory is based on an observation that molecules in molecular compounds invariably contain elements that belong to 5, 6, 7, 8 groups of the periodic system. Assumptions: (1) Molecules combine through unsaturation or through latent valences of elements, especially non-metallic, belonging to aforesaid periodic groups. (2) These elements exhibit their highest capable valence and combine through these by single or double bonds. But all their valences may not be satisfied. (3) Active groups and conditions of molecules may influence this latent valency and give rise to chain-compounds and consequent isomerism.

The diffusion of hydrogen through metals: H. G. DEMING AND B. C. HENDRICKS. Sheet metal of 0.15 mm. thickness was clamped between heavy steel blocks in an electric furnace, the diffusion area being circumscribed on the face of each block by a pair of concentric circular knife-edges. The channel between the knife-edges in the block on the incoming side was connected to a vacuum-pump; on the outgoing side to compressed nitrogen. The diffusion was thus limited to a definite area of metal or perfectly uniform temperature, even though the blocks were never pressed against the metal tight enough to make a gas-tight joint. Aluminum is impervious to hydrogen up to its melting point. Quantitative data have been obtained for copper, iron, and other metals.

The adsorptive property of fullers earth: STUART J. BATES AND ALFRED STAMM.

CHARLES L. PARSONS,
Secretary

AMERICAN MATHEMATICAL SOCIETY

THE two hundred and seventeenth regular meeting of the American Mathematical Society was held at Columbia University, on Saturday, October 29, 1921, extending through the usual morning and afternoon sessions. The attendance included forty members of the society. Thirty new members were elected.

The following papers were read at this meeting:

Total geodesic curvature: J. K. WHITTEMORE.

On the composition of polynomials: J. F. RITT.

Complete determination of polynomials whose inverses can be expressed in terms of radicals: J. F. RITT.

Concerning continuous curves in the plane: R. L. MOORE.

Concerning the relation of a continuous curve to its complement in space of three dimensions: R. L. MOORE.

An algebraic solution of Einstein's cosmological equations: EDWARD KASNER.

On biharmonic functions: T. H. GRONWALL.

General formulation of a combinatory method used by William Emerson and others: L. H. RICE.

A theorem on loci connected with cross-ratios: J. L. WALSH.

A generalization of the notion of covariants: L. B. ROBINSON.

Inductances of grounded circuits: G. A. CAMPBELL.

R. G. D. RICHARDSON,
Secretary