dilute acids or alkalies and inorganic solvents in general. Molecular weight determinations by the freezing point lowering method, when dissolved in benzene, gave values of 269, 270 and 272, which show that it is somewhat associated in benzene solution since the simple formula for $(CH_3CS)_2S$ has a molecular weight of but 150.

Conclusions

1. The solubilities of the different types of organic compounds in liquid hydrogen sulfide have been observed.
2. The presence of a double bond in the organic compound is usually shown by the development of the odor of a mercaptan.
3. The aldehydes, amines and acyl halides are the only types that show much evidence of reacting with the liquid hydrogen sulfide.
4. The amines give unstable addition products with hydrogen sulfide.
5. The aldehydes tend to substitute a sulfur atom for the sulfur of the aldehyde group to form a thio-aldehyde.
6. The acyl halides tend to substitute an SH group for the halide and an S for the oxygen and form dithio acids to a small amount. Acetyl chloride and bromide form the dithioacetic acid, which then loses hydrogen sulfide and forms the thioanhydride.

AMES, IOWA

NOTES

A Sensitive Test for Magnesium.[1,2]—K. Suitsu and K. Okuma[3] state that the azo dye, *o,p*-dihydroxy-azo-*p*-nitrobenzene gives a very sensitive test for the magnesium ion. This reagent has been used in the courses of qualitative analysis at this University for two years with excellent results. The authors claim to be able to detect $^1/_{500}$ mg. of magnesium by means of this test.

The dye is readily prepared by diazotizing *p*-nitraniline and coupling it with the theoretical quantity of resorcinol dissolved in dilute sodium hydroxide solution. The solution is acidified and the precipitated dye filtered off. The product may be purified by recrystallization from methyl alcohol as a dark red powder, m. p., 199–200°. A convenient concentration for ordinary use is a 0.5% solution of the dye in 1% sodium hydroxide. Some deterioration of the reagent occurs in solution after a year's standing.

The solution to be tested for magnesium is made slightly acid with dilute hydrochloric acid and one drop of the reagent added. On making

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[1] Hahn, *Ber.*, **57**, 1394 (1924); **60**, 975 (1927), describes a somewhat similar test for magnesium using 1,2,5,8-tetrahydroxy-anthraquinone.

[2] Since this note has been accepted for publication, the Eastman Kodak Company has informed me that they intend placing the reagent on the market.

[3] Suitsu and Okuma, *J. Soc. Chem. Ind. Japan*, **29**, 132–138 (1926); *C. A.*, **20**, 3000 (1926).

the solution alkaline with dilute sodium hydroxide, the characteristic sky-blue precipitate of the magnesium lake appears. If the amount of magnesium is very small, a drop of the stock reagent which has been diluted 4 to 5 times with water gives better results. In this case also the lake is rather slow in forming and shaking for two to three minutes is necessary to coagulate the precipitate.

Professor D. P. Smith of this University found that an excess of ammonium salts destroys the sensitivity of the reagent; hence in the regular course of analysis, the ammonium salts are "smoked off" in a casserole before applying the test.

Nickel and cobalt also give somewhat similar blue lakes which may lead to confusion. After the removal of the heavy metals by precipitation as sulfides, however, the test is absolutely characteristic and the confusion attending the use of the classical magnesium ammonium phosphate precipitate as a test, especially in elementary courses of analysis, is obviated.

CONTRIBUTION FROM THE
DEPARTMENT OF CHEMISTRY
PRINCETON UNIVERSITY
PRINCETON, NEW JERSEY
WM. L. RUIGH

RECEIVED NOVEMBER 14, 1928
PUBLISHED MAY 6, 1929

The Preparation of Selenic Acid and its Salts.—A number of methods for the preparation of selenic acid have been reported in the literature.[1] As a rule the salts of this acid have been prepared by the oxidation of the selenites.

Meyer and Heider[1a] treated selenium dioxide with 30% hydrogen peroxide, warming the mixture on the water-bath and upon analysis found that 48% of the oxide had been oxidized to selenic acid. In another experiment using a larger amount of hydrogen peroxide an analysis showed an oxidation of 70%.

The experiments of Meyer and Heider suggested that it might be worth while to try to find the best conditions for preparing selenic acid, and possibly the selenates, by the hydrogen peroxide method.

A number of experiments were carried out, treating weighed amounts of selenium dioxide with varying amounts of hydrogen peroxide. The time and the temperature of the treatment were varied. Oxidation values all the way from 20 to 70% were obtained. Small amounts of the oxide

[1] The methods for the preparation of selenic acid and its salts are found in the following references: (a) Meyer and Heider, *Ber.*, **48**, 1154 (1915); (b) Mitscherlich, *Pogg. Ann.*, **9**, 623 (1827); (c) Wohlwill, *Ann.*, **114**, 169 (1860); (d) *Wien Akad. Ber.*, **39**, 299 (1860); (e) Thomsen, *Ber.*, **2**, 598 (1869); (f) Diemer and Lenher, *J. Phys. Chem.*, **13**, 505 (1909); (g) Müller, *Ber.*, **36**, 4262 (1903); (h) *Chem.-Ztg.*, **31**, 630 (1907); (i) Meyer and Moldenhauer, *Z. anorg. Chem.*, **116**, 193 (1921); (j) Worsley and Baker, *J. Chem. Soc.*, **123**, 2870 (1923).