CHEMISTRY

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ABSTRACTS

A Study of the Acid-catalyzed Decarbonylation of 2,4,6-Trimethoxybenzaldehyde. HOWARD BURKETT, DePauw University.—The rates at which 2,4,6-trimethoxybenzaldehyde undergoes loss of the aldehyde group in 1 to 70% aqueous perchloric acid solutions have been determined at four different temperatures. Except in the highest acid concentration, the first-order rate plots are linear. Since the concentration of aldehyde was very low, this does not necessarily indicate the reaction to be unimolecular. The rate constants increase with increasing acid concentration to about 36% perchloric acid then decrease. The pKa of 2,4,6-trimethoxybenzaldehyde is -1.92. The aldehyde is essentially unionized (to its conjugate acid) in 20% perchloric acid, approximately one-half ionized in 37% perchloric acid and essentially completely ionized in 48% acid. These results are inconsistent with Hammett's unimolecular mechanism and with a bimolecular mechanism. The data may be explained by a "steady state" unstable intermediate in a bimolecular process or by a termolecular mechanism.

The Testing Program of the Division of Chemical Education of the American Chemical Society. EDWARD L. HAENISCH, Wabash College.—One or more tests of the objective type are now offered in general chemistry, qualitative analysis, quantitative analysis, organic, physical and biochemistry. These tests are constructed by committees in collaboration with professors actively teaching the courses. Over fifty people were involved in the construction of the most recent edition of the physical chemistry test. Norms are available for all tests. It is estimated that over 75,000 students took one or more of the tests during the 1954-1955 academic year. All tests are constantly being prepared in new forms and the work is expanding into the field of secondary school chemistry.

Physiological Action of Sulfonated Proteins. H. C. REITZ and A. G. JOSE, JR., Purdue University.—This paper reports the *in vivo* action of sulfonated casein in the white rat and sulfonated soybean protein in the rabbit. These protein derivatives prepared by the method of Reitz et al. were tested for *in vivo* anti-coagulant activity by the Lee-White clotting time test. Sulfonated casein was injected into rats by cardiac puncture so as to give levels of 50, 75, and 100 mg./kg. of body weight. Blood coagulation times were taken hourly for five hours on both the injected and on normal uninjected animals. At the 50 mg. level coagulation times were twice normal within two hours but fell to normal at the end of five hours. At the 75 mg. level coagulation times were three times normal within one hour and were still twice normal

after five hours. The effect of the 75 and 100 mg. levels were similar except that at the higher level no animal survived for five hours.

The same method was used for the determination of the anticoagulant effect of sulfonated soybean protein in the rabbit as was used for rats except the sulfonated protein was administered by venipuncture on a marginal ear vein. Studies were made at levels of 5, 15, and 25 mg./kg. of body weight. A species difference was demonstrated in that the coagulation time of rabbits was found to be prolonged from a normal range of 8 to 14 minutes to a value of 300 minutes at the 25 mg. level within one hour. The 15 mg. level gave a coagulation time of 120 minutes within one hour while the 5 mg. level showed no effect. Coagulation times returned to values of about 25 minutes after two hours.

Toxicity studies showed that the LD 50 for intravenous injection of sulfonated soybean protein is between 75 and 85 mg./kg. of body weight in the white rat and between 25 and 45 mg./kg. of body weight in the white rabbit. Infarction in the lungs of both rats and rabbits was a toxic effect.

An anticoagulant assay using the Quick procedure demonstrated that a sample of sulfonated soybean protein had retained its anticoagulant activity unchanged after six years storage at room temperature.

Specific and Selective Reagents. FRANK J. WELCHER, Indiana University.—One of the principal objects of modern analytical research is the development of specific reactions for the detection and determination of ions and compounds. The most promising reagents for this purpose are found among the organic compounds. In particular, organic molecules containing acidic and/or coordinating groups so located as to permit the formation of chelate compounds possess the most valuable analytical properties.

Certain atomic groupings confer the property of selectivity or specificity upon organic molecules. Thus, the α-dioximes yield red percipitates with the nickel ion in ammoniacal solution, and no other cation reacts similarly. The preparation of new analytical reagents is based on the synthesis of molecules containing these so-called "specific" groupings, with the systematic alteration of the remainder of the molecule to improve the selectivity. This is accomplished by the substitution of groups in such a manner as to affect the stability of complexes formed, steric relationships, acidity or basicity, color, and many other properties.