malonate, either in the pure form, or in solution in dry ether, a white crystallin reaction product is formed. This is also very unstable and rapidly liquefies in the air, losing hydrochloric acid, and appears to produce gummy polymerization products. This polymerization of the phenyliminomalonate appears analogous to that of phenyl isocyanate.

The Action of Alcohol on Methyl Phenyliminomalonate.—We have tested the action of methyl and ethyl alcohols, as well as benzyl alcohol, upon this substance. They all react vigorously with the evolution of heat, and loss of color of the iminomalonate, and produce well-defined, crystallin addition products. Mr. J. H. Bornmann has carried out the study of the product produced from ethyl alcohol, and in the following manner:

2.35 grams of methyl phenyliminomalonate were mixed with 0.49 gram (1 mol.) of absolute ethyl alcohol. There was an evolution of heat, a loss of color, and after a few hours the thick oil crystallized in colorless crystals. The substance was washed and recrystallized from alcohol and melted at 88° (uncor.). It is easily soluble in ether, benzene, chloroform and carbon tetrachloride; fairly soluble in alcohol; and slightly soluble in ligroin. While colorless in the pure form it slowly turns yellow when kept in a desiccator over sulphuric acid. This color change is probably due to a loss of alcohol and reproduction of the N=C double bond, which here acts as a chromophore in the phenyliminomalonate:

Calculated for $\begin{matrix} C_6H_5NH \\ C_2H_5O- \end{matrix}\!\!>\!C : (CO_2CH_3)_2$: C, 58.42; H, 6.36; N, 5.24.

Found: C, 58.65; H, 6.39; N, 5.17.

URBANA, ILL.

NOTES.

Hippuric Acid as the Cause of the Failure of the Spectroscopic Test for Hemoglobin in Urine.—During the winter of 1910–1911, Passed Assistant Surgeon C. H. Lavinder, of the Division of Pathology and Bacteriology of the Hygienic Laboratory, called my attention to the difficulty he was having in the identification of blood coloring matter in the urine from a case of suspected paroxysmal hemoglobinuria. The urine in question presented an appearance which would lead a clinician to suppose blood coloring matter to be present, and yet, when examined with the spectroscope, no absorption bands such as are produced by hemoglobin and its various derivatives in solution, were to be seen. Later, Dr. Lavinder succeeded in obtaining Teichman's crystals in the usual manner, and thus demonstrated the presence of blood coloring matter in the specimen of urine under examination.

In endeavoring to find an explanation for the non-appearance of the hemoglobin of other absorption bands in the spectrum of this specimen of urine, Dr. Lavinder introduced some fresh blood into a specimen of human urine known to be free of blood pigments, and noted that while at first the solution gave the characteristic hemoglobin spectrum, the bands gradually became indistinct, and eventually faded out entirely.

It thus appeared that there is present in normal urine some constituent which has the power of destroying hemoglobin, or at least of rendering it inactive spectroscopically. With the view of learning more on this point, and if possible, of determining the constituent of urine responsible for this conduct of the hemoglobin, the writer recently made the following experiments:

Solutions were made, as strong as possible, of uric acid and hippuric acid in distilled water. Owing to the very slight solubility of these acids, the solutions were very dilute. A third solution contained three per cent. of urea—a little more concentrated than this compound would normally be found in urine. Approximately equal amounts, about 0.1 gram, of fresh blood were introduced into 25 cc. portions of each of these solutions and also into distilled water in equal amount. The blood was introduced into the solutions successively as they were taken up, in order that the blood-containing solutions should not be standing while one was being examined. The solutions were then examined by means of a small Schmidt and Haensch direct-vision spectroscope, mounted vertically above a cylindrical absorption cell. In all four solutions, the characteristic spectrum of oxyhemoglobin was at first produced, the bands being very clearly seen. With the distilled water, the uric acid, and the urea solutions, no effect was observed, even after one-half to one hour's standing. With the hippuric acid solution, however, the characteristic spectrum could be seen to be fading even during observation, and at the end of five minutes the absorption bands had entirely disappeared. The series was repeated with exactly similar results. The disappearance of the characteristic hemoglobin spectrum was accompanied by a visible change in the appearance of the solution; immediately after the introduction of the blood, the solution presented the usual pinkish color of a dilute blood solution, but gradually became more and more brownish, until after the bands had entirely disappeared the solution presented a color much like that of a strong solution of ferric alum.

A few drops of the hippuric acid solution added to the 25 cc. of distilled water containing blood, acted more slowly, and finally appeared to cease to act, the absorption bands remaining visible for some time, but much less distinct than at first. In another experiment, the hippuric acid solution was found to be active in the presence of urea, of uric acid, and of both the latter.

To further test this matter, small portions of fresh blood were added to one per cent. solutions of hydrochloric, sulfuric and nitric acids, ammonium hydroxide and sodium hydroxide. All three acids immediately destroyed the hemoglobin spectrum, the action of the nitric acid being the most rapid. The sodium hydroxide solution also destroyed the spectrum, though not quite so rapidly, while the ammonium hydroxide solution did not appear to weaken the intensity of the absorption bands even after several hours' standing. This is, of course, in accordance with the well known production of hemoglobin-derivatives through the action of acids and caustic alkalis.[1] It would appear that in urine the action is due to the acidity produced by the hippuric acid; solutions, of this acid in water of a concentration equal to that in which it might be expected to occur in urine, are distinctly acid to litmus, while solutions of uric acid of the greatest concentration obtainable at ordinary temperatures react but very feebly acid to litmus. After neutralization of the hippuric acid solution to a distinctly alkaline reaction with sodium hydroxide, the absorption spectrum was still slowly destroyed, probably by the excess of alkali. Neutralization with ammonia and rendering slightly alkaline with the same reagent prevented the destruction of the characteristic spectrum, the spectral appearance remaining constant for about four hours, at the end of which it was as definit as at first.

In all of the above the spectrum observed was that of oxyhemoglobin. No spectroscopic evidence was obtained of the formation under these conditions, in solutions of the concentrations used of the absorption spectra of other forms of hemoglobin, or of its derivatives. The fact that so-called "hemoglobinuria" is usually actually "hematinuria" has frequently been noted, and the case in point seems to be an example. The fa lure of the hematin spectrum may have been due to the adsorption of the hematin by some phosphate or other precipitate.

It is somewhat strange that there is little or nothing on the failure of the spectroscopic test for *hemoglobin* in urine, in either the medical or chemical or chemical literature Most of the textbooks on legal and clinical chemistry recommend the spectroscopic tests for hemoglobin as the most definit and one of the most delicate tests for blood coloring matter, and no question as to its applicability to urine seems to have been raised. Perhaps this is mainly due to the fact that the spectroscope seems to have been employed but very little in testing for blood in urine, preference having usually been given to the chemical (oxygen-carrier) tests and the formation of hemin or other crystals.

It would seem desirable, therefore, that when a specimen of urine is suspected to contain blood-coloring matter, and has to be laid aside for some time before the application of the spectroscopic test for *hemoglobin*

[1] See Neubauer and Vogel, *Analyse des Harns*, 10th Ed., pp. 495, 554.

it should first be rendered slightly alkaline with ammonia water, in order to prevent the destruction of the hemoglobin, if present, by the acids (mainly hippuric) present in the urine. F. ALEX. MCDERMOTT.

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NEW BOOKS.

A Laboratory Manual of Inorganic Chemistry. By EUGENE C. BINGHAM, Ph.D. (Johns Hopkins), Professor of Chemistry, Richmond College, Richmond, Virginia, AND GEORGE F. WHITE, Ph.D. (Johns Hopkins), Associate Professor of Chemistry, Richmond College, Richmond, Virginia. New York: John Wiley and Sons. London: Chapman and Hall, 1911. viii + 147 pp. Price, $1.00 net (4/6 net).

This is a 12mo. volume printed on a stout paper, interleaved with blank pages, and neatly bound in dark blue cloth. The subject matter is divided into three parts: Part I, "Inorganic Preparations" (45 pp.), deals with the preparation and examination of the common gases, and of a few other substances such as bromine, iodine, potassium chlorate and sodium hydroxide. Part II, "Qualitative Analysis" (74 pp.), discusses the dry-way tests, and the wet-way reactions of and analysis for basic and acidic radicals, with the group separations. For the method of separating the metals of the iron and zinc groups the authors "are largely indebted to Messrs Noyes, Bray and Spear." Part III, "Quantitative Analysis" (11 pp.), gives detailed directions for half a dozen quantitative experiments illustrating the fundamental laws. These experiments, it is stated, may be introduced at the discretion of the instructor during the early part of the course.

The instructions throughout are admirably lucid and "have been made full, so that no good excuse may be offered for slovenly work." In Part I, the student is required to answer questions frequently but not perpetually. Part II abounds in formulas and equations and is thus not merely a set of laboratory directions to accompany a reference work, but is itself largely informative, stating what happens rather than enquiring this of the student. References to other text-books are, indeed, not frequent. The only general inorganic text cited in the list of chemical reference literature on p. 140 is that of Holleman.

The printing, unfortunately, is somewhat uneven and frequently out of alignment. A few printer's and other errors have been noticed, but the text is, for a first edition, remarkably free from errata. Without doubt, the book will prove a most serviceable one to those whose first year's laboratory teaching in chemistry requires a text of this character.

ALAN W. C. MENZIES.

Electrical Nature of Matter and Radioactivity. By HARRY C. JONES, Professor of Physical Chemistry in the Johns Hopkins University. Second Edition, Completely Revised. New York: D. Van Nostrand Co., 1910. viii + 210 pp. Price, $2.00.