The soda salt, $C_{10}H_6(NaSO_3) - N = N - C_6H_3\begin{matrix}OH\\OH\end{matrix}$, is prepared from the foregoing by treating with NaOH. Brown crystalline powder, soluble in water. The constitution of the above named compound can be found in its reduction products, which are naphthionic acid and amidoresorcine.

Parazodibromsulphoxylbenzole-β-naphthol, $C_6H_2Br_2(\overset{4}{H}SO_3) - \overset{1}{N} = N - \beta\text{-}C_{10}H_6OH$. This interesting compound was obtained by allowing equal molecules of paradiazobibrombenzolesulpho acid and β-naphthol to react on one another; the solution being kept slightly alkaline until the end of the reaction. The mixture thus obtained was then heated slightly and saturated with HCl, which precipitated the free acid in the shape of an amorphous, orange-red mass. This was then washed, and crystallized from water.

The free acid is pretty soluble in hot water, less so in cold.

The soda salt can be obtained from the acid by treating with NaOH.

Reducing agents form amidotribrombenzolesulpho acid and amidonaphthol.

In concluding, I would say, that I hope next fall to be able to give a much fuller account of these compounds, with the analytical data.

XXIX.—On the Action of Light and Darkness on Standard Ammonium Chloride and Tannin Solutions.

By A. R. Leeds, Ph.D.

In the December number of the Proceedings of the American Chemical Society, for 1878, in a paper "On the Alteration of Standard Ammonium Chloride Solution, when kept in the Dark," I have given a brief resumé of the labors of MM. Schloesing and Muntz on the dependence of nitrification upon the presence of an organized ferment, and of the researches of Mr. R. Warington upon the necessity of darkness to the development of the nitrifying body. A standard ammonium chloride, kept in the dark, was found to contain a determinable amount of nitrites, and the titre of the solution to have diminished by an amount sufficient to unfit it for employment in Nesslerizing. These results were connected, by the author, with the transformation of the elements of ammonia into nitrous acid, under influence of fungoid growth in the dark. At the close of this article, it was stated that two methods of avoiding the change were naturally suggested: "1st. Keeping the ammonium solutions, not in

the dark, as generally happens, but in the light. 2nd. Addition of a drop of chloroform or carbon disulphide. The disulphide is inapplicable, speedily blackening the Nessler reagent. The chloroform in our possession was not entirely without action, but it was so slight as to be hardly appreciable when a drop was diffused in a considerable amount of water. 1 liter of standard ammonium chloride solution containing 0.25 mgrm H_3N per c.c., was divided into four parts, each part being placed in ¼-liter bottle. A piece of fungus found rapidly growing in a bottle of sodium acetate, was after repeated washing, put in each bottle. A drop of chloroform was introduced into two of the bottles, one of which has been placed in the light, the other in darkness. The bottles without chloroform have been similarly placed, and it is proposed, after a suitable interval, to determine what changes, if any, have occurred since then."

This has now been done, after a lapse of eighteen months, with the result of showing that no alteration has occurred in any one of them. Neither have the fungi placed in the solutions, changed in appearance or increased in size. The chloroform remained in the bottles as at first.

What difference then was there in the conditions under which the four last solutions were placed, as compared with the solution originally tried, which is adequate to account for the difference in the results? We know of none, except that the bottles containing the last four solutions were nearly filled with the liquid, and were sealed with paraffine. Apparently, the oxygen requisite for the transformation of the elements of ammonia into nitrous acid, under the influence of the growing organism in the dark, had been derived from the oxygen of the air contained in the partly filled bottle used in the original experiment. But in the later experiments, even in darkness and in the solution containing no chloroform, no change had occurred, the presence of free oxygen apparently being requisite for the conversion of the ammonia into nitrous acid, under the circumstances given.

With standard tannin solutions the results were quite different. At the time at which the ammonium solutions were prepared, a solution of tannin was also made, which contained in 1 liter of water, 1.482 grm of the acid. The liquid was divided into four portions, to each portion a similar fungoid growth was added, and they were then placed in liter bottles, securely paraffined, but, of course, with a space in each bottle above the liquid, containing air. Two bottles, one with two drops of chloroform, the other without, were placed at a south-

ern window, so as to be exposed for a considerable portion of the time to bright sunlight; two bottles similarly prepared, were put in darkness. As long as the bottles were left exposed to the sunlight for a portion of each day, the development of the fungus was extremely slow, and the liquid darkened very slightly. But at the end of fourteen months, these solutions were transferred to the diffused light of the laboratory, when the development of the fungus became much more rapid, and at the expiration of eighteen months, when all four bottles were opened, it was apparently little less in amount than that contained in the bottles which had remained in darkness during the entire interval. The odor of chloroform had disappeared from all four, showing that the chloroform, itself, had undergone decomposition, and what was still more striking, the amount of fungoid growth in the two bottles containing chloroform in light and darkness, was fully as great as the two similarly placed, but without chloroform. In fact, of the two bottles placed in the light, that containing the chloroform had lost the larger percentage of tannin, and, judging from this diminution, apparently had undergone the greater alteration. In the dark, however, the percentage of tannic acid in the bottle containing chloroform had not diminished to so great an extent as the bottle without, and the presence of the chloroform seemed, in this case, at least, to have exerted a somewhat preservative action upon the solution.

The conclusion to be drawn from both series of experiments is, that the circumstances most favorable to the indefinite preservation of standard solutions of this character, are *exposure to light, exclusion of air, and absence of germs of fungoid growth.*