Chloroform.—The melting- and freezing-points were identical, namely: —63.2° C. This result is probably correct to 0.2°. Berthelot[1] gives —70° C.

Ether.—The melting-point was found to be —117.6° C., which is probably accurate to 0.3°. Olzewski[2] gives —117.4° C. Ladenburg and Krügel[3] found—113.1 C.

Toluene.—The melting-point varied between —97° C. and —99° C. Ladenburg and Krügel found 93.2° C.

A well-stirred mixture of solid carbon dioxide and ether gives a bath having a remarkably constant temperature of about —79.5 C., under normal pressure; by reducing the pressure over this mixture, by means of a good water-pump, constant temperatures down to —103° C. can be obtained.

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ON TRISULPHOXYARSENIC ACID.

[Preliminary Notice].

By Leroy Wiley McCay and William Foster, Jr.

Received January 29, 1904.

By the action of magnesium oxide on freshly prepared arsenic pentasulphide suspended in water, we have obtained a solution from which, after removing the dissolved magnesium with sodium hydroxide, we have been able to isolate the tertiary sodium salt of trisulphoxyarsenic[4] acid.

We simply add alcohol to the well-cooled solution, then lower the temperature still further, whereupon feathery crystals gradually separate out, which, on standing[5] in contact with the liquid, pass into fine fern-like forms. By recrystallization in the presence of a small quantity of sodium hydroxide, the salt is obtained pure.

When filtered off, washed with 50 per cent. alcohol and dried

[1] Berthelot: *Bull. Soc. Chim.* [2], **29**, 3-4.

[2] Olzewski: *Wiener Monatsh. Chem.*, **5**, 37.

[3] Ladenburg and Krügel: *Ber. d. chem. Ges.*, **33**. 637.

See the recent work of Foster: *Ztschr. anorg. Chem.*, **37**, 64 (1903).

[5] After adding the alcohol, the flask with its contents is put in the ice-box for about twelve hours.

quickly, by pressing between filter-paper and by fanning, the salt is pure white. Even when impure, it has but a faint yellowish tinge.

When dissolved in water and tested in the cold with a few drops of Weinland's reagent,[1] the solution remains clear and colorless. This serves to distinguish it from the sulpho-salt. Upon standing or upon heating, the solution becomes yellow, and sulphide of antimony separates out.

If a dilute solution of the compound is rendered strongly acid with hydrochloric acid, thoroughly shaken and then filtered, a clear filtrate is obtained which, after boiling for a few moments, becomes only faintly turbid.

By making a similar test with an equal quantity of sodium disulphoxyarseniate ($Na_3AsO_2S_2 + 11H_2O$) of the same dilution, the filtrate, upon boiling, becomes rapidly and strongly cloudy. In both cases hydrogen sulphide is evolved.

A fairly dilute solution of the salt treated with a solution of barium chloride gives a pearly precipitate which closely resembles barium disulphoxyarseniate, but it forms much more slowly than the latter. The precipitate is most probably barium trisulphoxyarseniate.

By dissolving 0.03 gram sodium disulphoxyarseniate in 10 cc. water, and an equal quantity of trisulphoxyarseniate in an equal volume of water, and testing each of the solutions with barium chloride, there is formed almost instantly a heavy precipitate of barium disulphoxyarseniate, while the barium trisulphoxyarseniate appears only after vigorous shaking and the lapse of some moments, and in exceedingly small quantity.

Evidently barium trisulphoxyarseniate is much more soluble in water than barium disulphoxyarseniate.

The yield of sodium trisulphoxyarseniate is highly satisfactory. In several operations we have succeeded in preparing more than 30 grams.

The first analysis below was of the first crop of crystals prepared by direct precipitation with alcohol; the second was of the recrystallized salt.

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[1] *Ztschr. anorg. Chem.*, **26**, 327 (1901).

	Calculated for $Na_3AsOS_3 + 11H_2O$.	Found. I.	II.
Sodium	15.22	15.58	15.88
Arsenic	16.50	16.71	16.78
Sulphur	21.16	20.26	20.70
Oxygen	3.52	4.26	3.48
Water	43.60	43.19	43.16
Total,	100.00	100.00	100.00

In another case the salt obtained by direct precipitation with alcohol contained 20.80 per cent. sulphur. After the first recrystallization, the sulphur was 21.31 per cent.; and after the second 21.25 per cent., which is very nearly the theoretical value. Sodium trisulphoxyarseniate effloresces rapidly in a hot room; therefore, the crystals should be dried as speedily as possible.

We expect to publish a more complete account of this interesting acid in the near future.

PRINCETON, N. J.,
January, 20, 1904.

REVIEWS.

Recent Work in Biological Chemistry.

By P. A. LEVENE.

THE greater part of cell and tissue constituents is of proteid nature. The conception of protoplasm was always, in a way, associated with that of living proteids. It is, therefore, natural that the efforts of biological chemists for years were directed toward the study of the chemical nature of proteid material. Through these efforts it was established that in the cell the majority of proteids occur in a more or less intimate combination with various substances. The groups binding the proteids in tissues were designated by Kossel as "prosthetic" groups. Until recently, the knowledge of the chemical nature of either of these two groups of the complex molecule of a combined proteid was very limited. However, the work done during the last few years has added much to our knowledge of the subject.

It has been known that both the simple proteids and the prosthetic groups yield, on hydrolysis, certain simple chemical bodies. But no information as to the manner in which the simple substances combined in order to form the complex molecule of proteid, was obtained.

The work of Drechsel, Miescher, Kossel, Schulze and Emil Fischer on hydrolytic cleavage of proteids has resulted in the dis-