

ODLING ON THE DETECTION OF ARSENIC IN COPPER. 247

XXX.—*Note on the Detection of Arsenic in Copper.*

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As even in the most satisfactory performance of Reinsch's test for arsenic—the deservedly favourite test of English toxicologists—there is always some, although but an extremely small quantity of the copper wire, foil, or gauze dissolved, and as commercial copper is rarely quite free from arsenic, and sometimes contains a very notable proportion thereof, it is important that the copper to

be used in medico-legal researches as a precipitant for arsenic should be specially tested as to its purity.*

But, as in the ordinary mode of experimenting by Reinsch's process, the amount of metal dissolved is scarcely appreciable, it is quite unnecessary to submit any considerable quantity of it to examination. If a solution of four or five grains of the copper does not yield any evidence of arsenic, it is quite pure enough for the purpose, even though a little arsenic should be recognised in the solution of a larger quantity.

As a means of detecting traces of arsenic in copper, the author believes that the following process is superior to any hitherto proposed in conjoint delicacy and rapidity of operation.

A few grains of the copper, cut into fine pieces, are placed in a small tube-retort with an excess of hydrochloric acid and so much ferric hydrate or chloride as contains a quantity of iron about double the weight of the copper to be acted upon. The mixture is then distilled to dryness, some care being taken at the last to prevent spurting. The whole of the copper is in this way quickly dissolved, and any arsenic originally contained in it carried over in the form of chloride of arsenic, which may be condensed in a little water with the excess of aqueous hydrochloric acid. The resulting distillate is then tested for the presence of arsenic, by treating it with sulphuretted hydrogen, or, preferably, by boiling in it a fresh piece of clean copper foil or gauze. In some cases, the residue left in the retort may be treated with a little fresh hydrochloric acid, again distilled to dryness, and the distillate collected and tested along with that first produced.

Most oxygenants other than ferric chloride are objectionable, as by their reaction with hydrochloric acid they give rise to free chlorine which passes over with the distillate, and renders it unfit for being immediately tested either with sulphuretted hydrogen or fresh copper. Cupric oxide, or chloride on the other hand, is scarcely active enough for the purpose; while the dissolution of copper in hydrochloric acid brought about by mere exposure to the air is extremely tedious.

It may be as well to add that ferric chloride is rendered quite free from arsenic by evaporating it once or twice to dryness with excess of hydrochloric acid.

* Taylor—Guy's Hospital Reports [3], vi, 201; Abel and Field—Journal of Chemical Society, xiv, 291.