

ON SOME BLOWPIPE-REACTIONS.

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I.—ON THE REACTIONS OF METALLIC THALLIUM BEFORE THE BLOWPIPE.

The following reactions are given from direct experiments by the writer: *

In the closed tube, thallium melts easily, and a brownish-red vitreous slag, which becomes pale-yellow on cooling, forms around the fused globule.

In the open tube, fusion also takes place on the first application of the flame, whilst the glass becomes strongly attacked by the formation of a vitreous slag, as in the closed tube. Only a small amount of sublimate is produced. This is of a grayish-white colour, but under the magnifying-glass it shews in places a faint ridescence.

On charcoal, *per se*, thallium melts very easily, and volatilizes in dense fumes of a white colour, streaked with brown, whilst it imparts at the same time a vivid emerald-green coloration to the point and edge of the flame. *If the heat be discontinued, the fused globule continues to give off copious fumes, but this action ceases, at once, if the globule be removed from the charcoal.* A deposit, partly white and partly dark-brown, of oxide and teroxide is formed on the support; but, compared with the copious fumes evolved from the metal, this deposit is by no means abundant, as it volatilizes at once where it comes in contact with the glowing charcoal. If touched by either flame, it is dissipated, immediately, in imparting a brilliant green colour to the flame-border. The brown deposit is not readily seen on

* The reactions given by Crookes are as follows:—"The metal melts instantly on charcoal, and evolves copious brown fumes. If the bead is heated to redness, it glows for some time after the source of heat is removed, continually evolving vapours which appear to be a mixture of metal and oxide. A reddish amorphous sublimate of proto-peroxide surrounds the fused globule. When thallium is heated in an open glass tube, it melts and becomes rapidly converted into the more fusible protoxide, which strongly attacks the glass. This oxide is of a dark red colour when hot, solidifying to a brown crystalline mass. The fused oxide attacks glass and porcelain, removing the silica. Anhydrous Peroxide of Thallium is a brown powder, fusing with difficulty and evolving oxygen at a red heat, becoming reduced to the protoxide. The phosphate and sulphate will stand a red heat without change."