On a New Complex Copper Cyanogen Compound.

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(Preliminary Note.)

When a cold concentrated solution of KCN is added to a cold concentrated solution of cupric chloride or sulphate, but not nitrate, greenish brown cupric cyanide is precipitated; the precipitate dissolves on further addition of KCN with formation of a claret red to violet red compound, much resembling potassium permanganate solution. Further addition of KCN destroys the color, with precipitation of white cuprous cyanide (presumably), which then dissolves in excess of KCN. First addition of concentrated cupric salt solution, or the solid salt, to concentrated KCN solution produces a brilliant violet color, instantly destroyed by further addition and quickly disappearing on standing. Further additions of copper salt give the red compound, provided the solution is kept nearly at 0°; otherwise cyanogen is evolved and the red compound is not formed. If the solutions are too concentrated or too dilute, the red compound is not formed. Solutions about one-half saturated appear to give the compound most readily and in largest amount.

Search through the available literature has revealed no reference to such a compound. It is quite unstable, decomposing to a brown solution on standing in a warm room over night; is instantly decomposed by strong and weak acids and bases and by pyridine; soluble in alcohol, but insoluble in chloroform, ether, benzene, toluene and carbon tetrachloride. Attempts to crystallize out the compound are in progress, and at the time of writing appear promising. The method pursued is as follows: Solid $CuCl_2.2H_2O$ was added in small amounts to KCN solution about one-half saturated, with constant shaking in ice water. After the red color reached a maximum, the solution was filtered, three volumes of 95% alcohol added and placed in the icebox in an exhausted desiccator. After 24 hours white opalescent scales separated, which, after washing with alcohol and ether and drying, present a metallic appearance somewhat resembling tinfoil. These contain copper and may be cuprous cyanide. The solution retained its red color unchanged and it is hoped that the compound can be crystallized out in form suitable for analysis.

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