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### ON PURIFICATION OF FOLIC ACID

FOLIC acid, even B.P. quality, may often contain some impurities, most probably due to the photochemical changes, and as such it is sometimes found unsuitable for a standardisation work. Sakami and Knowels<sup>1</sup> (1959) have reported a chromatographic procedure for purifying folic acid freed from all free amines and other fluorescent matters. The chromatographic procedure has been found to be fairly time-consuming. As such fresh attempt has been made to work out a simpler technique for purifying folic acid with better recovery. This has been achieved by forming an insoluble complex salt of folic acid with cetrimide.

An aqueous solution of folic acid (B.P.), containing about 35 mg. per ml., was exposed to light until the folic acid content came down to about 30 mg. per ml., as assessed according to Hutchings *et al.*<sup>2</sup> To this solution was added *p*-aminobenzoic acid 1 mg. per ml. as an impurity. Bentonite used in the experiment was supplied by M.G. Corporation of Bombay.

The whole process of purification has been carried out in the dark at room temperature. Folic acid solution (5 ml.) was precipitated with 1% solution of cetrimide (29.5 ml.) and the harvested precipitate was washed twice with distilled water (10 ml. × 2). The precipitate was then suspended in 4% sodium citrate solution (8 ml.) and slowly with stirring ethanol (8 ml.) was poured in, when the complex salt dissolved completely. The solution was filtered through Whatman (No. 42) paper and acidified to pH 4.0 with acetic acid to precipitate the folic acid. The precipitate obtained was again dissolved in a mixture of 4% sodium citrate (5 ml.) and ethanol (5 ml.), pH being adjusted to about 7.0, and filtered as above. The filtrate was precipitated at pH 4.0 with acetic acid, and the precipitate was dissolved in distilled water (10 ml.) by adjusting pH to 7.0 with sodium hydroxide. The solution was subsequently admixed with bentonite (0.25 gm.), and filtered through Whatman (No. 42) paper.

The pure folic acid was then precipitated at pH 4.0 with acetic acid, washed twice with ethanol (5 ml. × 2) and twice with acetone (5 ml. × 2) and dried over calcium chloride under vacuum, the yield being about 125-130 mg.

The purified bright yellow folic acid was found to be absolutely freed from any free amine (Bratton and Marshall)<sup>3</sup> as well as from all fluorescent matters (Sakami and Knowels).

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### AMPEROMETRIC DETERMINATION OF ANTIMONY AND THIOCYANATE WITH HYPOBROMITE

OF the numerous methods available for the determination of antimony and thiocyanate, the volumetric procedures are found to be most accurate and rapid. Generally, antimony in trivalent condition is determined with chloroamine T<sup>1</sup> and potassium bromate,<sup>2</sup> and thiocyanate by Volhard's method<sup>3</sup> using a standard solution of silver nitrate. Following the application of sodium hypobromite as an oxidant in the alkaline medium,<sup>4</sup> and in amperometry its utility in the oxidation of selenite<sup>5</sup> at the rotating platinum micro-electrode was reported earlier from these laboratories. The possibility of an extended application of this procedure to several other oxidation reactions has been investigated. Preliminary experimental results showed the oxidation to be complete in the case of Sb<sup>3+</sup> and thiocyanate at a pH of 7.0-8.5. More detailed study revealed that accurate and reproducible results are obtained at a pH of 8.2. Thus, Sb<sup>3+</sup> in tartar emetic required one oxygen atom and thiocyanate four oxygen atoms for the oxidation to be complete, and the process may be represented by equations (1) and (2) respectively.

