J. Indian Chem. Soc.,
Vol. 72, May 1995, pp. 355-356

NOTE

Micro-determination of Ascorbic Acid in Pure and Pharmaceutical Preparations

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Manuscript received 1 February 1993, revised 29 September 1993, accepted 20 December 1993

Ascorbic acid is of great medicinal importance It is effectively used to treat scurvy, anaemic impaired growth haemorrhage etc. A number of methods have been developed for the determination of ascorbic acid[1,2] with different reagents. The present communication describes a simple and new titrimetric method for the milligram determination of ascorbic acid with *N*-bromosaccharin reagent. The method has also applied to pharmaceutical preparations, i.e. tablets and injection.

Results and Discussion

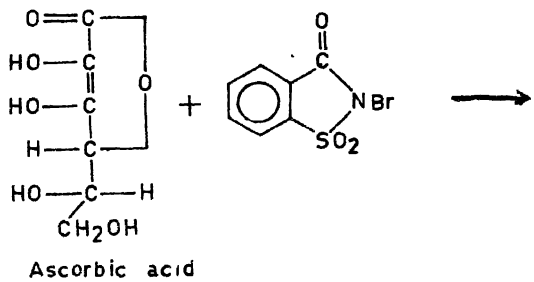
The results (Tables 1 and 2) show that the determination of ascorbic acid in pure and pharmaceutical preparations has an accuracy of ± 1%. The percentage recovery of the sample is fairly constant with the varying sample size (1–5 mg). The reaction proceeds quantitatively and the oxidation is completed within the prescribed reaction time at room temperature.

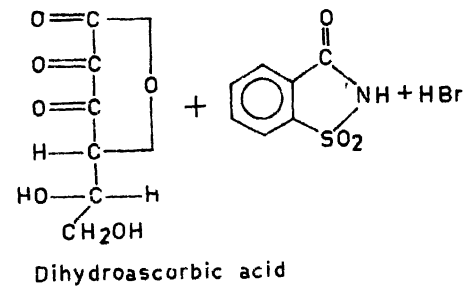
TABLE 1–DETERMINATION OF ASCORBIC ACID IN PURE SAMPLE WITH *N*-BROMOSACCHARIN*

Amount taken mg	Reaction time min	Amount recovered mg	Stoichiometry	Error %
1 0000	2	1 0057	1	+0 57
3 0000		3.0120		+0 40
5 0000		5 0350		+0 70

*In each case three determinations were done

The effect of variation in reaction time was also investigated. For quantitative and constant results, 2 min time is sufficient. Further increases in the reaction time has no effect either on the speed of the reaction or the recovery of the sample. Of course, a lesser reaction time leads to lower recovery indicating an incomplete reaction. The stoichiometry of the reaction was also established. 1 mole of *N*-bromosaccharin was found to react with 1 mole of ascorbic acid. Considering stoichiometry and the previous literature available, the following course of reaction may be suggested for the determination of ascorbic





acid with *N*-bromosaccharin reagent. The proposed mechanism finds support from previous reports[2].

A unique feature of this method is that ascorbic acid can be determined even in presence of other reducing substances like glucose, sucrose, starch and cellulose.

TABLE 2–DETERMINATION OF ASCORBIC ACID IN TABLETS AND INJECTIONS*

Name of tablets or injection	Amount taken mg	Amount recovered mg	Error %
	1.0000	1.0027	+ 0 27
Celin	3 0000	2 9890	- 0 36
	5.0000	4.9816	- 0 36
	1 0000	1 0046	+ 0 46
Sukcee	3.0000	2.9946	- 0.18
	5 0000	5.0146	+ 0 29
	1.0000	1 0048	+ 0.48
Chewcee	3.0000	2.9890	- 0.36
	5 0000	4 9890	- 0 22
	1.0000	1.0048	+ 0 48
Citravit	3 0000	2.9948	- 0 17
	5.0000	4 9816	- 0 36
	1 0000	1 0046	+ 0 46
Calcium sandoz	3.0000	2 9944	- 0 18
	5.0000	5 0146	+ 0 29
	1 0000	1 0048	+ 0 48
Osto-calcium	3.0000	2.9890	- 0 36
	5 0000	4 9816	- 0 36
	1 0000	0 9980	- 0 20
Becosule	3.0000	2.9898	- 0 32
	5 0000	4.9890	- 0 22
	1 0000	0 9970	- 0.30
Sorvicin	3 0000	2 9880	- 0 40
	5 0000	5 0210	+ 0 42
	1 0000	1 0057	+ 0 57
Redoxon*	3.0000	3 0120	+ 0 40
	5 0000	5.0350	+ 0 70

Experimental

N-Bromosaccharin[3] (1.3116 g) was dissolved in glacial acetic acid (100 ml) and made up to 250 ml with distilled water. The solution was standardised a gainst sodium thiosulphate[4]. A stock solution of sodium thiosulphate (2.4820 g) was prepared in distilled water (1 lit) and standardised with 0.02 *M* $CuSO_4$ solution. A 1% (w/v) aqueous solution of KI was prepared.

A 1% stock solution of ascorbic acid (G.R.) was prepared in distilled water. A known excess volume of the injection solution containing definite quantity of ascorbic acid was diluted to 100 ml with distilled water.

The tablet was well powdered and definite quantity was dissolved in a distilled water. The contents were shaken well for 15 minutes and if needed filtered to remove impurities.

Procedure : To an aliquot containing 1–5 mg of the sample was added 0.02 *M* solution (15 ml) of *N*-bromosaccharin and the mixture was allowed to stand for 2 min at room temperature with occassional shaking. KI (10 ml) was then added to it and shaken thoroughly and kept for 1 min. The liberated iodine was titrated against standard 0.01 *M* sodium thiosulphate solution using starch as indicator. A blank experiment was also run under identical conditions.

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