Asian Journal of Chemistry Vol. 17, No. 2 (2005), 1287–1289

NOTE

Analytical Determination of Antihistamine Drugs in Pure and Its Pharmaceutical Formulations

R.P.S. CHAUHAN*, BALWANT SINGH, A. SURAIYA†, RAMVILAS PRASAD and IMTEYAZUL HAQUE

Department of Chemistry, Gaya College, Gaya-823 001, India
Email: rps_chauhan2@yahoo.com; Fax: (91)(631)2229361

A quick and convenient method has been developed for the micro estimation of antihistamine drugs. 1–5 mg of sample is allowed to react with 10 mL of 0.02 M, N-bromosaccharin solution. Unconsumed reagent can be accurately titrated with 5 mL of 15% KI and 0.02 N sodium thiosulphate solution using starch as indicator. SD and CV was calculated for reproducible and accurate result. The accuracy of the method is within ± 1%.

Key Words: Determination, Antihistamine drugs.

Phenothiazine and its derivatives are referred to as antipsychotropic, antihistamine drugs[1–4]. Antihistamine drug is one that inhibits, sharpens or alters the nature of emotional and behavioural responses. These drugs have also been employed for the symptomatic treatment of neurotic and psychotic conditions. These drugs are administered orally because of their great medicinal importance. Several workers have reported the pharmacology and determination of phenothiazine derivatives[5–12] the halosaccharin reagents are stable and determine different compounds[13–15] in different reaction conditions. Singh *et al.*[16] determined antihistamine drugs pure and its pharmaceutical preparations with BrCl reagent in acetic acid medium. The present method is better than the existing methods and does not require a catalyst and sophisticated instrumentation.

0.05240 g of N-bromosaccharin (NBSA) was accurately weighed and dissolved in 40 mL of glacial acetic acid by shaking thoroughly in 100 mL volumetric flask. The solution was made up to the mark with distilled water and standardized iodometrically[17]. A stock solution of sodium thiosulphate was prepared by dissolving 4.9604 g of sodium thiosulphate in distilled water in a 1 L volumetric flask. The solution was standardized with 0.02 N copper sulphate iodometrically.

Sample solution: Stock solutions of all phenothiazine derivatives were prepared by dissolving 50 mg accurately weighed amount of the sample in distilled water in 50 mL standard volumetric flask.

Procedure

An aliquot containing 1–5 mg of sample from the stock solution was transferred to a 100 mL glass stoppered conical flask and 10 mL of N-

†Department of Chemistry, G.B.M. College, Gaya, India.

bromosaccharin solution was added. The flask was stoppered and the reaction was allowed to proceed for 10 min at room temperature with occasional shaking. The stopper was washed with 5 mL of distilled water followed by addition of 5 mL of 15% KI solution. The contents were shaken thoroughly and liberated iodine was titrated against standard sodium thiosulphate solution using starch as indicator. A blank experiment was also run under identical experimental conditions.

$$\text{Recovery of sample (mg)} = \frac{(V_B - V_S) \times n \times W}{2N}$$

where V_B = Volume of sodium thiosulphate solution required to titrate blank (mL)

V_S = Volume of sodium thiosulphate solution required to titrate samples (mL)

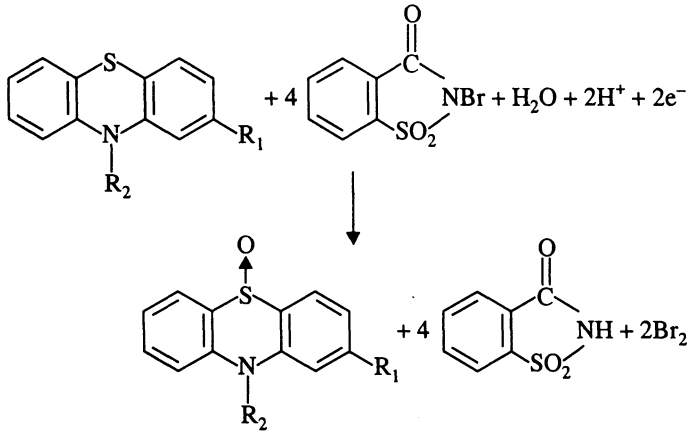
N = Normality of sodium thiosulphate solution

W = Molecular weight of sample

n = Stoichiometry

With recommended procedure, the determination of largactile, stemetil, phenargan, siquil tablets and chloropromazine hydrochloride (pure sample) has been successfully achieved on 1–5 mg of sample within an accuracy of ±1% (Table-1).

The effect of variables such as reaction time, concentration of reagent and temperature were studied. It was found that the recommended concentration of N-bromosaccharin (NBSA) reagent is suitable to achieve quantitative reaction. Accurate and constant results were obtained when the reaction was carried out at room temperature and normally the reaction is completed within 10 min. Considering the stoichiometry and the available literature it may be believed that chloropromazine hydrochloride forms their monosulphoxide derivative with NBSA reagent.



where R_1 = Cl, R_2 = —$CH_2(CH_2)_2$—$N(CH_3)_2$

TABLE-1
DETERMINATION OF ANTIHISTAMINE DRUGS WITH 0.2 M NBSA

S.No.	Sample	Amount taken (mg)	Reaction time (min)	Amount recovered (mg)	Stoichio-metry	Error (%)	SD	CV
1.	Chloropromazine hydrochloride (pure sample)	1.0000	10	0.9960	4	–0.40	0.0045	0.4494
		3.0000		3.0072		+0.24	0.0130	0.4660
		5.0000		5.0155		+0.31	0.0137	0.2735
2.	Largectile (Tab)	1.0000	10	1.0014	4	+0.14	0.0060	0.5990
		3.0000		3.0075		+0.25	0.0115	0.3712
		5.0000		4.9885		–0.29	0.0114	0.2279
3.	Stemetil (Tab)	1.0000	10	0.9974	4	–0.26	0.0016	0.1604
		3.0000		3.0108		+0.36	0.0120	0.0398
		5.0000		5.0155		+0.31	0.0137	0.2735
4.	Phenergan (Tab)	1.0000	10	1.0051	4	+0.51	0.0094	0.0934
		3.0000		3.0108		+0.23	0.0091	0.3030
		5.0000		5.0155		+0.36	0.0137	0.2735
5.	Siquil (Tab)	1.0000	10	1.0054	4	+0.34	0.0070	0.0698
		3.0000		3.0114		+0.38	0.0028	0.0561
		5.0000		5.0180		+0.36	0.0168	0.3350

In each case three determinations were done.

REFERENCES

1. R. Gasa, *J. Pharmac. Chemother.*, **17**, 442 (1961).
2. United States Pharmacopoeia, **18**, 423.
3. J.J. Lewis, An Introduction of Pharmacology, London, p. 251 (1961).
4. Goodmans & Galimann, Pharmacological Basis of Therapeutics, 4th Edn.
5. C.F. Chignell, Methods in Pharmacology, **22**, 199 (1970).
6. S.H. Curry, *J. Pharm. Pharmac.*, **22**, 199 (1970).
7. L.A. Luzzi, *J. Pharm. Sci.*, **62**, 1261 (1973).
8. E. Davis, *Clin. Chim. Acta*, **38**, 265 (1972).
9. B.M. Alture, PhD. Thesis, New York University (1964).
10. ———— , *Fedn. Proc. Fedn. Aim. Soce Exp. Biol.*, **23**, 252 (1964).
11. T.J. Haley, *Phermc. Exp. Thesis*, **100**, 393 (1950).
12. H.A. Zarem, *J. Physiol.*, **212**, 1081 (1967).
13. R.P.S. Chauhan, V.K. Dubey and U.B. Singh, *Asian J. Chem.*, **6**, 665 (1994).
14. R.P.S. Chauhan, J.K. Verma, A. Nigam, S.K. Nigam and M.U. Khan, *Oxid. Comm.*, **18**, 304 (1995).
15. A.L. Harihar, M.R. Kembhavi and S.T. Nandibewoor, *J. Indian Chem. Soc.*, **76**, 128 (1999).
16. R.P.S. Chauhan and M.P. Singh, *Acta. Ciencia Indica*, **19C**, 112 (1993).
17. M.Z. Barakat, *Anal. Chem.*, **26**, 1973 (1954),

(*Received*: 25 November 2002; *Accepted:* 11 October 2004) AJC-4082