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NOTE

Polarographic Studies of Lisinopril

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A novel and simple polarographic method is described for the estimation of lisinpril and its pharmaceutical formulation. The polarogram was recorded from +200 mV to –1.0 V using 0.5 M acetic acid and 10 mM copper sulphate as background electrolyte and calomel electrode as reference electrode.

Lisinopril[1, 2] is an angiostensin converting enzyme inhibitor and it is chemically 1[N-(S)-1-carboxy-3 phenyl propyl]-L-lysyl)-L-proline dihydrate. It is mainly used in treatment of hypertensions[3]. The drug is also used as an adjunct in the treatment of congestive heart failure. USP[2] describes a HPLC method for the estimation of lisinopril where acetonitrile in phosphate buffer is used as mobile phase. Other reported analytical methods are fluorimetric methods[4, 5], immunoassay method[6], GLC method[7] and HPLC methods[8, 9]. In the present study, a simple, specific and convenient method is described to estimate lisinopril in tablet formulations.

Potentiostat-Wenking LB75 (M) laboratory Model (Germany) scan generator and X-Y recorder Ridkadnki (Japan) instrument was used for recording the polarogram. A potential range of +200 mV to –1.0 V and scan rate of 100 mV/sec was used for the study. A three electrode assembly of glassy carbon (3 mm dia) as working electrode, a platinum electrode as counter electrode and a calomel electrode as reference electrode, was used. 0.5 M acetic acid and 10 mm copper sulphate solution was used as background electrolyte.

Preparation of standard solution: Twenty mg of pure lisinopril was accurately weighed and transferred into a 100 mL volumetric flask. It was dissolved and diluted upto the mark. From this working standrad solution was prepared by diluting 10 mL to 100 mL with water in a volumetric flask.

Preparation of sample solution: Twenty tablets were weighed and the powder equivalent to 20 mg was accurately weighed and dissolved in a 100 mL volumetric flask with water. Both the sample and standard solutions were chromatographed on a paper to separate the amino acids. After the completion of the chromatographic separation, spots were detected and these spots were cut into pieces of approximately 10 sq. mm and placed in a centrifuge tube. Added 3 mL of supporting electrolyte to the centrifuge tube and allowed to stand overnight to ensure complete diffusion of the amino acid from the paper.

General procedure

A portion of a centrifuged supernatant liquid was transferred into the polarographic cells. Added 2 mg of sodium sulphate and dissolved by stirring with a glass rod, and inserted the dropping mercury electrode. Then a potential of –0.5 V was applied and the polarogram was recorded after deaeration of the solution for 10 min. A calibration graph was constructed with different concentration of amino acid and the polargraphic steep height. The amount of lisinopril found and per cent recovered are given in Table-1.

TABLE-1
ANALYSIS OF LISINOPRIL BY POLAROGRAPHY

Brand name of the tablet formulation	Labelled amount mg/tablet	Amount found mg/tablet		(%) recovery
		Proposed method[a]	Reported method[b]	
Lisoril	5	4.990	5.002	99.8
Hipril	5	4.980	5.018	99.6

[a]Each result is the mean of three replicates.
[b]HPLC method: Lisinopril was chromatographed on a hypersil ODS (C_{18}) column (250 × 4.6 mm 5 μ) using acetonitrile and phosphate buffer as a mobile phase at a flow rate of 1 mL/min

The polarograms of solutions containing lisinopril were recorded using manually operated polarograph potentiometer and galvanometer with 0.5 M acetic acid and 10 mm copper sulphate solution as background electrolyte. This method was attempted due to the presence of amino acids in lisinopril. The percentage recovery values 99.6 and 99.8 for the estimation of tablets indicated the non-interference of tablet excipients and hence they may be used for the routine analysis of tablet formulation.

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