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Determination of Verapamil Hydrochloride in the Tablet and Injection Solution by the Verapamil-Sensitive Electrode and Possibilities of Application in Pharmaceutical Analysis

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Abstract : Verapamil is a drug used in medicine for arrhythmia, angina, and hypertension as a calcium channel blocker. In this study, a Verapamil-selective electrode was prepared, and the concentrations of the components in the membrane were as follows: PVC (32.8 wt %), O-NPhOE (66.6 wt %), and KTPClPB (0.6 wt % or approximately 0.01 M). The inner solution containing verapamil hydrochloride 1 x 10^{-3} M was introduced, and the electrodes were conditioned overnight in 1 x 10^{-3} M verapamil hydrochloride solution in 1 x 10^{-3} M orthophosphoric acid. These studies have demonstrated that O-NPhOE and KTPClPB are the best plasticizers and ion exchangers, while both direct potentiometry and potentiometric titration methods can be used for the determination of verapamil hydrochloride in tablets and injection solutions. Normalized weights of verapamil per tablet (80.4±0.2, 80.7±0.2, 81.0±0.4 mg) were determined by direct potentiometry and potentiometric titration, respectively. Weights of verapamil per average tablet weight determined by the methods of direct potentiometry and potentiometric titration were" 80.4±0.2, 80.7±0.2 mg determined for the same set of tablets, respectively. The masses of verapamil in solutions for injection, determined by direct potentiometry for two ampoules from one set, were (5.00±0.015, 5.004±0.006) mg. In all cases, good reproducibility and excellent correspondence with the declared quantities were observed.

Keywords : verapamil, potentiometry, ion-selective electrode, lipophilic physiologically active amines
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