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Analytical Method Development and Validation for the Simultaneous Estimation of Valsartan and Hydrochlorothiazide in Bulk and Pharmaceutical Dosage Forms Using RP-HPLC Method

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A robust, precise, and accurate Reverse Phase High-Performance Liquid Chromatography (RP-HPLC) method was developed and validated for the simultaneous estimation of valsartan and hydrochlorothiazide in bulk drug and pharmaceutical dosage forms. The objective was to establish a single, reliable chromatographic technique for the routine quality control of combination formulations containing both antihypertensive agents.Chromatographic separation was achieved on a C18 column using a mobile phase consisting of acetonitrile and phosphate buffer (pH adjusted to 3.0 with orthophosphoric acid) in a suitable ratio under isocratic conditions. The flow rate was maintained at 1.0 mL/min and detection was carried out at 270 nm. The method was validated in accordance with ICH Q2(R1) guidelines for parameters such as linearity, accuracy, precision, specificity, limit of detection (LOD), and limit of quantification (LOQ).The developed RP-HPLC method demonstrated good resolution between valsartan and hydrochlorothiazide with retention times of approximately [insert retention times, e.g., 4.5 and 6.8 minutes]. Linearity was observed in the concentration range of e.g., 10–100 µg/mL for valsartan and 5–50 µg/mL for hydrochlorothiazide] with correlation coefficients (r^2) > 0.999 for both drugs. Recovery studies confirmed the accuracy of the method with percentage recoveries ranging from 98.0% to 101.5%. The method also showed acceptable precision, with %RSD values well below 2%.The validated RP-HPLC method is simple, fast, and reliable for the simultaneous determination of valsartan and hydrochlorothiazide in bulk and tablet dosage forms. It is suitable for routine quality control analysis in pharmaceutical industries.

Biography

P.Yamuna has her own experience in valuation and passion for ML and data. The research team built this model after many years of experience in research, evaluation, work in both hospitals and scientific laboratories. This approach meets all the requirements for precise, specific, sensitive diagnostics. .

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