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Method development and validation for aceclofenac with two solvent systems by using spectrophotometric technique

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The current study was presented to develop and validate more simple, accurate, precise, efficient and economical UV-visible spectrophotometric method for the estimation of aceclofenac in bulk and pharmaceutical dosage form. Aceclofenac is an anti-inflammatory drug used for rheumatoid arthritis and other inflammatory conditions. Various analytical techniques are available for its assay and validation. UV-visible and HPLC techniques are most commonly used in pharmaceutical analysis. The purpose of this study is to compare methanol and phosphate buffer pH 7.4 solution for aceclofenac standard and its brands in Pakistan i.e. Acenac, Airtal and Alkeris tablets using UV vis- spectroscopic method. The official method for assay of aceclofenac in BP is potentiometric titration. Absorption maximum ($\lambda_{\max}$) was found to be 275 and 273 for methanol and buffer solution respectively. The drug was analyzed in the ranges of 0.5-50 mg/L in methanol and 0.4-50 mg/L in buffer. The method showed linearity having line equation $y=0.0316x$ and $y=0.0245x$ and correlation coefficient as $R^2=0.9998$ and 0.9999 respectively. The method was specific and reliable that verifies the absence of interference at the $\lambda_{\max}$ of aceclofenac. Single point calibration was determined for each sample tablet and was found to be in range showing linear regression line. The relative standard deviation of six replicates was less than 2%. The per cent standard deviation (RSD %) of inter-day precision was 0.2343 and 0.7757 range and intraday precision range was 0.4458 to 0.6740 and was 0.78437 to 0.81298. The limit of detection and limit of quantification was 0.0148 and 0.01898 for both solvents. The commercial tablets also showed assay within specified limits as Acenac 109.33%, Airtal 103.90% and Alkeris 105.61% and as 108.70%, 100.69% and 106.60% respectively. Hence the method was found to be reliable for aceclofenac alone as previous methods were mostly used for simultaneous analysis of aceclofenac with other drugs. Due to simplicity, rapidness, reliability and efficiency; both methanol and phosphate buffer 7.4 may be used for the assay of aceclofenac in tablet dosage forms by UV-visible technique effectively.

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