

Spectrophotometric, Fluorimetric and High Performance Liquid Chromatographic Methods for the Determination of Celecoxib.

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Abstract

Simple spectrophotometric, spectrofluorimetric and stability indicating high performance liquid chromatographic methods were presented for the determination of celecoxib in pure and dosage forms. The spectrophotometric method depends on the interaction of the drug with p- dimethylamino benzaldehyde to form a colored product in presence of ferric ion. The chromogenic product obeys Beer's law over concentration range of 3.2 – 12.8 µg ml⁻¹ at a maximum at 395.0 nm. The spectrofluorimetric method is based on measuring of the native fluorescence of the drug in 0.05M hydrochloric acid at 399 nm when excited at 298 nm. Fluorescence intensity versus concentration is linear over concentration range of 4-12 µgml⁻¹. The last presented method is a stability indicating high performance liquid chromatographic method where a chromatographic separation of the drug in presence of its acid degradation product using naproxen as an internal standard was achieved on Lichrosphere R60 C18 column (250mm× 4mm, 5µm). The mobile phase was consisting of a mixture of methanol and water (75:25v/v) at a flow rate of 1ml min⁻¹. Detection was performed at 254 nm and a linear relationship was obtained over a concentration range of 0.8-2.88 µg/20 µl. Separation was complete on less than 6.5 min where retention times were 1.791, 2.457 and 6.430 min for celecoxib acid degradation product, naproxen and intact celecoxib, respectively. The proposed methods were applied successfully for the determination of the drug in its pharmaceutical formulation. The methods were statistically compared with a reported method where there were no significant difference concerning accuracy and precision. The method can be used for the routine quality control of the drug.

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