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Spectrophotometric Determination of Rofecoxib in Pharmaceutical Dosage Forms

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A colorimetric method has been developed for the determination of rofecoxib. Rofecoxib produces a yellow color chromogen in alkaline solution (pH 10-12), which exhibits a λ_{max} at 355 nm. The system followed Beer-Lambert's Law in the concentration range of 5-40 μg/ml. The method is simple, economic, convenient, reproducible, precise and free from interference by excipients.

Rofecoxib, {4-[4-(methylsulfonyl) phenyl]-3-phenyl-2-(5H)-furanone} is comparatively a new non-steroidal antiinflammatory drug[1], that is active at a low dose[2] and has less gastric toxicity[3]. It inhibits the activity of the enzyme, cyclooxygenase, which is responsible for the formation of prostaglandins in normal physiological conditions[4,5]. Prostaglandins are involved in mediating inflammation, swelling, pain and fever. It is preferred over conventional NSAIDs[6] as they may lead to serious GI complications such as ulcer, severe bleeding and perforation, resulting in hospitalization and even death[7]. It is available in tablets and the analytical methods reported for its determination are based mainly on HPLC[8,9]. Therefore, the aim of the present investigation is to develop a simpler and cheaper analytical method as compared to HPLC methods for the determination of rofecoxib in various formulations. Rofecoxib produces a yellow chromogen in alkaline solution (pH 10-12), which exhibits λ_{max} at 355 nm. The yellow colored chromogen is monitored spectrophotometrically for the determination of drug in different formulations.

A Shimadzu UV-2101 PC, UV/VIS spectrophotometer was used for all absorbance measurements. Rofecoxib was obtained as a gift sample from Ranbaxy Laboratories, New Delhi.

Rofecoxib (25 mg) was accurately weighed and dissolved in 20 ml of methanol in a volumetric flask. The final volume was made up with 0.5 M sodium hydroxide solution to 100 ml to obtain a concentration 250 μg/ml. This stock solution was used to prepare various standard solution of drug.

Aliquots of stock solution of rofecoxib (0.2-1.6 ml, 250 μg/ml) were transferred into a series of 10 ml of volumetric flasks and volume was made up to the mark with 0.5 M sodium hydroxide solution. The absorbances of the chromogen were measured at 355 nm against the reagent blank solution (prepared similarly without using drug).

The rofecoxib content in two marketed brands of rofecoxib tablets were determined. Ten tablets of rofecoxib were taken and finely powdered by trituration. A powder equivalent to 25 mg of drug was weighed accurately and transferred into a 100 ml volumetric flask. Methanol (20 ml) was added to the flask, sonicated for 20 min and then diluted to volume with 0.5 M sodium hydroxide solution. The resultant was filtered through Whatman filter paper no 41. Filtrate (10 ml) was then transferred into a 100 ml volumet-

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ric flask and diluted to volume with 0.5 M sodium hydroxide solution. The absorbance of the sample solution was recorded at 355 nm. The drug content in the sample was then calculated.

Recovery study was performed by spiking a 10 ng/ml solution of drug and found to be 99.5% and 99.2% in the marketed samples of dolib (Panacea Biotech Ltd.) and rofebax (Ranbaxy Laboratories), respectively.

A yellow color produced in alkaline solution (pH 10-12) of rofecoxib was used to determine the drug in the dosage forms. A linear curve was constructed between the concentration and absorbance and find out the equation of the line, which is Y=0.02333X+0.002827 with correlation coefficient of 0.9936. This indicates a good linearity between concentration and absorbance. It also shows that rofecoxib followed Beer-Lambert's Law in the concentration range of 5-40 μg/ml. The value for molar absorptivity and Sandell's sensitivity were found to be 7.592 x 10^3 l/mol.cm and 4.5 x10^{-4} μg/cm^2/0.001, respectively.

The proposed method was successfully applied to the analysis of rofecoxib in two different brands of tablets (dolib and rofebax) obtained commercially. The mean recovery was found to be in the range of 0.8% with RSD values less than 0.5%. It was observed that the excipients did not interfere in the determination of rofecoxib. Hence, the proposed method could be used for routine determination of rofecoxib in its dosage forms, as it is cheap, convenient, precise and reproducible.

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Synthesis and Biological Activity of 2-(3',5'-Dibromo-2'-hydroxyphenyl)-3-aryl-5H/methyl/carboxymethyl-4-Thiazolidinones

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With a view to map out the synthesis and antimicrobial activity of series of 2-(3',5'-dibromo-2'-hydroxyphenyl)-3-aryl-5H/methyl/carboxymethyl-4-thiazolidinones (III-a-ss) have been prepared by the cyclocondensation of N-substituted-(3,5-dibromo-2-hydroxy benzylidene)-anilines (II) with α-substituted mercaptoacetic acids and evaluated for their *in vitro* growth inhibiting activity against several microbes. Some of the compounds show significant antimicrobial activity.

4-Thiazolidinones play a vital role owing to their wide range of biological activities and industrial importance[1-4]. Furthermore bromophenols are also known to possess significant biological activities[5-8]. In continuation of our earlier work, we have therefore undertaken synthesis of 4-thiazolidinones incorporating bromophenolic moiety with a view to assessing pharmacological profile of the compounds synthesised.

Different aromatic amines were condensed with 3,5-dibromo salicyldehyde to yield respective Schiff's bases (II)

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