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# UV Spectrophotometric Determination of Oxaprozin in Pure and Pharmaceutical Formulation

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A simple, sensitive, spectrophotometric method in UV region has been developed for the determination of oxaprozin in bulk and tablet dosage form. Solution of oxaprozin in 0.1 N NaOH shows maximum absorbance at 285 nm with apparent molar absorptivity of $1.3082 \times 10_4$ L/mol cm. Beer's law was obeyed in the concentration range of 2-20 µg/mL with 0.9992 as and the slope, intercept were 0.0118, 0.04377, respectively. Results of the analysis were validated statistically and by recovery studies (100.21 ± 0.8709). Result of percentage recovery and placebo interference shows that that the method was not affected by the presence of excipients which proves suitability of the developed method for the routine estimation of oxaprozin in bulk and solid dosage form.

**Key Words: Oxaprozin, UV Spectrophotometry.**

## INTRODUCTION

Oxaprozin, chemically 4,5-diphenyl-2-oxazole propionic acid[1,2] (Fig. 1), is best known as a non-steroidal antiinflammatory agent which is used for the treatment of pain, inflammation and rheumatic conditions. The empirical formula is $C_{18}H_{15}NO_3$ and its molecular weight is 293.317. A few HPLC methods[3-8] have been reported for estimation of oxaprozin in biological fluids. However, there is no visible and UV methods have been reported in the literature for estimation of oxaprozin. The present study is to develop an accurate and reliable UV method for determination of oxaprozin in bulk and its solid dosage forms. Our present investigation aimed to develop a simple, rapid precise, accurate and economical visible spectrophotometric method for the analysis of oxaprozin in bulk and solid dosage forms.

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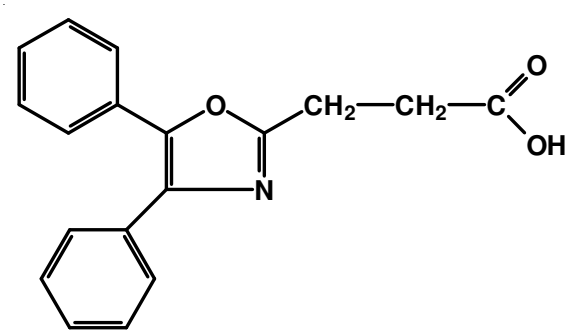


Fig. 1. Strucutre of oxaprozin

## EXPERIMENTAL

An Elico UV/Visible double beam spectrophotometer SL-164 with 1 cm matched quartz was used. Pure oxaprozin form (Dr. Reddys Labs, Hyderabad, India) and tablets formulations were procured from a local pharmacy.

**Standard stock solution:** Oxaprozin standard (10 mg) was accurately weighed and dissolved in 10 mL of water to give a stock (1 mg/mL).

**Method development:** Aliquots of stock solution were transferred into series of 10 mL of volumetric flasks and volume was adjusted with 0.1 N NaOH to give the concentration of 2, 4, 6, 8, 10, 12, 14, 16, 18 and 20 µg/mL. The individual samples were scanned from 200-400 nm, the maximum absorbance was observed at 285 nm against 0.1 N NaOH as blank (Fig. 2).

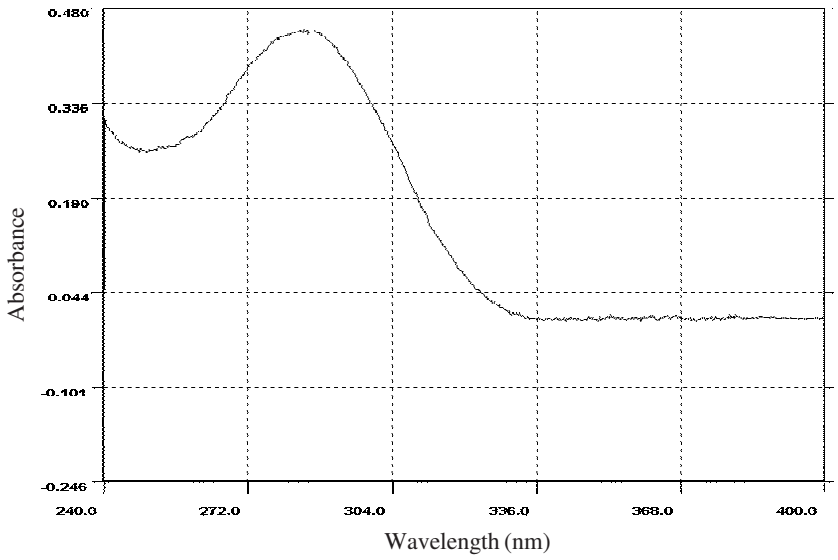


Fig. 2. Absorption spectra of oxaprozin ($\lambda_{max}$)

**Beer's law standard plot:** Beer's law standard plot was constructed by plotting concentration *vs.* absorbance which is found to be linear in the concentration range of 2-20 µg/mL and the optical characteristics molar absorptivity are given in Table-1.

TABLE-1
OPTICAL CHARACTERISTICS

| Parameters | | Values |
|---|---|---|
| $\lambda_{max}$ (nm) | | 285 |
| Beer's law limit (µg $mL^{-1}$) | | 2-20 |
| Sandell's sensitivity (µg $cm^{-2}$/0.001 absorbance unit) | | 0.02242 |
| Molar absorptivity (L $mol^{-1}$ $cm^{-1}$) | | $1.3082 \times 10^4$ |
| Regression equation (Y = a + bc) | Slope (b) | 0.01180 |
| | Intercept (a) | 0.04377 |
| Correlation coefficient (r) | | 0.99920 |

**Estimation of oxaprozin in tablet dosage forms:** A quantity of mixed contents of 20 tablets equivalent to 100 mg of oxaprozin was dissolved in 100 mL of 0.1 N NaOH. This solution was filtered using Whatmann filter paper No. 41 and further diluted with 0.1 N NaOH to 10 µg/mL concentration and the absorbance measured at 285 nm against 0.1 N NaOH as a blank.

**Repeatability:** The repeatability of the method was studied by recording the UV-spectrum and measuring the absorbance at $\lambda_{max}$ 285 nm of standard solution of oxaprozin for six times. The results are summarized in Table-2.

**Precision of assay:**

**Inter-day precision:** This was done by analyzing formulation by same analyst and informant but for 6 d subsequently. The % RSD values are shown in Table-2.

**Intra-day precision:** This was done by analyzing formulation in same day for six times of individual preparation and observation. The % RSD and datas are shown in Table-2.

TABLE-2
RESULTS OF ASSAY AND PRECISION STUDIES

| Sample | Label claim (mg/tab) | Amount found (mg/tab) | (%)* | CV* | Precision** | | |
|---|---|---|---|---|---|---|---|
| | | | | | Repeat-ability | Inter-day | Intra-day |
| Oxaprozin tablets | 600 | 599.92 ± 0.232 | 99.96 ± 0.4121 | 0.2473 | 0.317 | 0.00163 | 0.0024 |

*Mean of six determinations. **SD of five determination.

**Recovery study:** Recovery studies were carried out by adding a known quantity of pure drug to a pre-analyzed formulations and the proposed method was followed. From the amount of drug found, percentage recovery was calculated. The results of analysis and recovery studies are given in Table-3.

TABLE-3
RECOVERY STUDY

| Drug | Label claim (mg/tab) | Estimated amount (mg/tab) | Spike level (%) | Amount of drug added (mg) | Amount of drug recovered (mg) | Percentage recovery ± SD* |
|---|---|---|---|---|---|---|
| Oxaprozin tablets | 600 | 599.41 | 50 | 5.0 | 5.01 | 100.16 ± 0.2456 |
| | | | 75 | 7.5 | 7.49 | 100.17 ± 0.5745 |
| | | | 100 | 10.0 | 10.18 | 101.38 ± 0.6473 |
| | | | 125 | 12.5 | 12.52 | 100.21 ± 0.8709 |
| | | | 150 | 15.0 | 14.92 | 99.50 ± 0.4235 |

*Mean of six determinations.

## RESULTS AND DISCUSSION

The optical characteristics like $\lambda_{max}$, Beer's law range, regression, molar absorptivity and Sandell's sensitivity were given in Table-1. The regression analysis showed that the method was linear in the lowest concentration range of 2-20 µg/mL. The percentage recovery values indicated that there is no interference from the excipient(s) present in the formulation. Precision of the method also proved that the method have less deviation that is more precise.

The developed UV method is found to be simple, sensitive, accurate, precise and most reproducible and can be used for the routine quality control analysis of oxaprozin in bulk drug and its formulations.

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