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UV SPECTROPHOTOMETRIC ASSAY METHOD FOR THE DETERMINATION OF MELOXICAM TABLET AVAILABLE IN THE MARKET

[1]Safila Naveed*, [2]Humera Ishaq, [1]Maheen Nafees, [1,3]Tanweer Alam, [3]Ghulam Sarwar

[1]Faculty of Pharmacy Jinnah University for women, Karachi.

[2]Faculty of Pharmacy Hamdard University Karachi.

[3]Drug Regularity Authority of Pakistan, Government of Pakistan, Karachi.

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***Correspondence for Author**
Safila Naveed
Faculty of Pharmacy, Jinnah University for women Karachi.
safila117@yahoo.com

ABSTRACT

A very simple, accurate, rapid and economical UV Spectrophotometric Assay Method was developed for the determination of Meloxicam Tablets. The maximum Absorbance of Meloxicam was found to be 260nm and 0.1N NaOH was used as a suitable solvent to find Meloxicam. By this method we also get to understand the accuracy and also the fact that it obeys Beer-Lambert's Law. Meloxicam that is available in Karachi in different brands within the Pharmacies, those were collected and used for this assay method. The results showed the assay results of all brands were in range. This study would turn out to be very beneficial and with this simple and accurate method, one can easily determines Meloxicam.

KEYWORDS: Meloxicam, Non Steroidal Anti-Inflammatory Drug, Spectrophotometer.

ABBREVIATIONS

- **NSAID-** NON STEROIDAL ANTI-INFLAMMATORY DRUG
- **MLX-** MELOXICAM
- **MLX -01-** MELOXICAM BRAND 01
- **MLX -02-** MELOXICAM BRAND 02
- **MLX -03-** MELOXICAM BRAND 03

INTRODUCTION

Meloxicam is chemically 4-hydroxy-2-methyl-1-N (5-methyl-2-thiazolyl)-2H-1, 2-benzothiazine-3-carboxamide-1, 1-dioxide, [Fig-1] is non steroidal anti-inflammatory drug (NSAID) with antipyretic and analgesic properties. Prostaglandins are chemical substances that contribute to inflammation of joints. Meloxicam performs its mechanism of action by inhibiting prostaglandin synthetase (cylo-oxygenase 1 and 2) which leads to a decrease of the synthesis of prostaglandins and so inflammation is reduced. In contrast with other NSAIDs, it has neither acute nor chronic gastrointestinal toxicity. The very low solubility of Meloxicam in acidic medium, it may cause local gastrointestinal adverse events.

Literature survey reveals that Meloxicam is determined by using HPLC[1] HPTLC[2] and some spectrophotometric method.[3-8]

The present study describes simple, sensitive, accurate, rapid and economical spectrophotometric metho for the estimation of meloxicam tablet dosage form.

Figure 1 : Structure of Meloxicam.

EXPERIMENT

Instruments

For the measurement of Absorbance, Spectrophotometer (Schimadzu UV-1800 Spectrophotometer) was used and for the weighing of this method Digital Balance was used. Sonicator was also used in this assay method. For weighing, analytical balance was also used for this and an ultrasonic bath (Ultrasonic LC60H Elma Japan) was used as well.

Reagents and Chemicals

All chemicals were used as Analytical Grade and MLX's brands sample were searched from different Pharmacies for the usage.

Preparation of Meloxicam solution of different brands

Separately weigh each tablet of three brands of MLX. Grind and triturate the tablets separately with the help of mortar and pestle for each brand to convert them into powder form. Accurately weighed triturated powder equivalent to 20 mg of MLX in a tare beaker for each brand i.e. MLX -01, MLX -02 and MLX -03 and dissolve them in small quantity of de-ionized water. Then these solutions were transferred into three different 100ml volumetric flasks. Finally make-up the volume with de-ionized water to 100 ml for each sample. This stock solution is used to make further dilutions of individual brands in concentration of about 50, 25 and 12.5. All these solutions are then determined for their absorbance by using UV-Visible spectrophotometer, the absorbance of solutions of each brand of MLX was determined at wavelength max of 260nm using blank as 0.1N NaOH. The absorbance of different solutions of each brand are shown in Table 1, 2 and 3.

RESULTS AND DISCUSSIONS

In this research article, the results analysis produced by using a software i.e**.** SPSS. One way ANOVA is applied on this article results and the results are found to be non-significant which indicates that there is no difference found in the absorbance of the different brands of drugs of Meloxicam available in Karachi Pharmacies. This means that all the results have resemblance with each other as all these brands are of same generic.

A very simple and economical method was developed to find the estimation of MLX which carried out by using spectrophotometer on different brands of Meloxicam available in Karachi Pharmacies. Four different dilutions of each brand were prepared (100ppm, 50ppm, 25ppm and 12.5) and their absorbances are shown in table 1, table 2 and table 3. According to USP, Meloxicam tablet contains not less than (NLT) 90.0 % and not more than (NMT) 110.0 % of the labeled amount of ($C_{14}H_{13}N_3O_4S_2$) Meloxicam and according to this, the results of % assay was found in range and the results of their percent assay is shown in table 4 and regression equation and regression line is obtained. For the detection of linearity, absorbance of these prepared different solutions of 100ppm, 50ppm, 25ppm and 12.5ppm were taken. For linearity plot concentration vs. absorbance at level 100ppm, 50ppm, 25ppm and 12.5ppm of each brand is shown in figure 2, figure 3 and figure 4. Suitable solvent for this method was 0.1N NaOH and the maximum absorbance in Spectrophotometer of MLX was found to be 260nm. Squared correlation coefficient of each brand is shown which should not be less than 0.99. Squared correlation coefficient value of all the brands of MLX are well within the limit.

In all results we find acceptable degree of linearity. All three brands of MLX showed linear relation with their dilution.

Table 1: Absorbance of MLX.

Conc in ppm	MLX-01	MLX-02	MLX-03
100	1.21	1.2	1.22
50	0.612	0.631	0.69
25	0.361	0.372	0.35
12.5	0.14	0.151	0.14

Table 2: Results of % assay of different brands.

Brand Name	% Assay
MLX-01	103.7391304
MLX-02	100.1304348
MLX-03	100.5217391

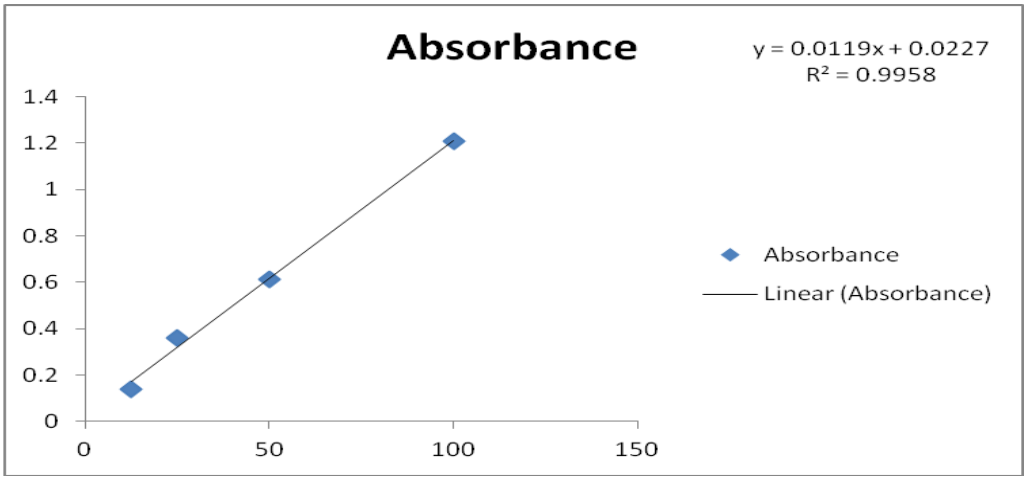

Figure 2: Linearity and range of MLX-01

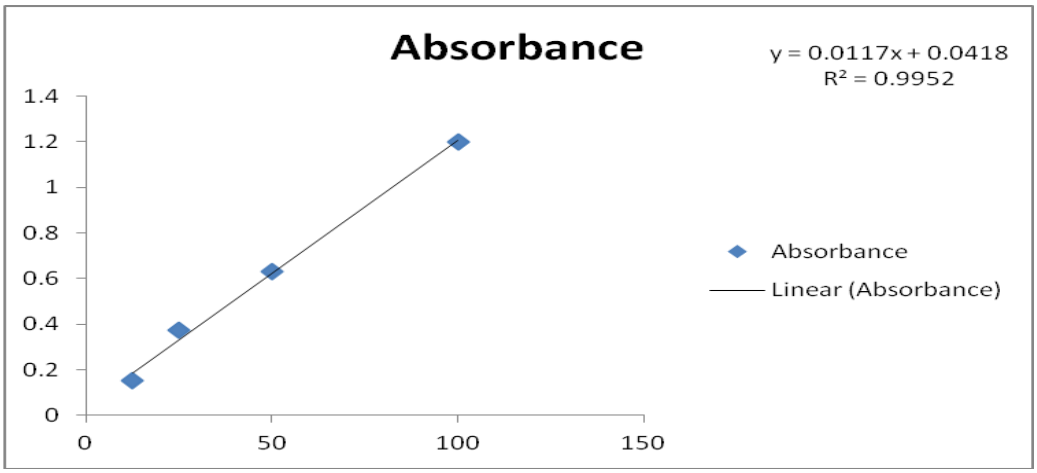

Figure 3: Linearity and range of MLX-02

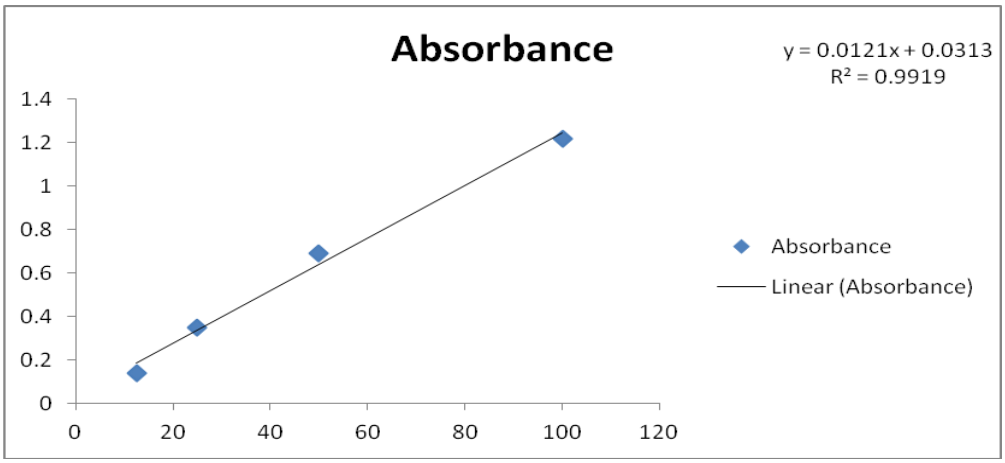

Figure 4: Linearity and range of MLX-03.

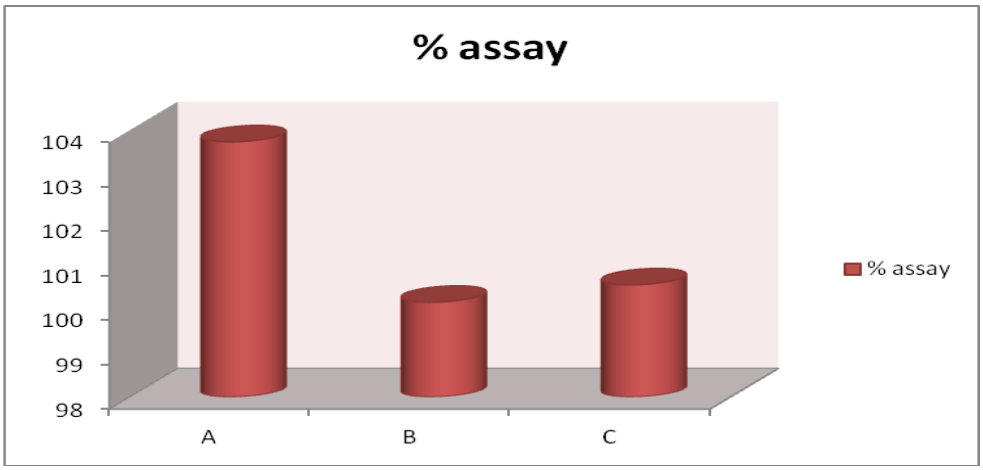

Figure 5: Graph for % assay of different brands.

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