



A Simple UV-Vis Spectrophotometric Assay study on different brands of Mefenamic Acid, Paracetamol and Furosemide

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ABSTRACT

The objective of the project seeks to develop an effective significant less going to consume as well as simple spectrophotometry for such assay of Mefenamic acid Paracetamol and Furosemide. Comparative of assay of 3 distinct brand products of Mefenamic acid (Meftal 250-dt, Mefacid, Mefac), Paracetamol (T-98, Parawal-500, Crocin) and Furosemide (Lasix, Frusenex, and Furosemide) available in medical store of Akkalkuwa dist-nandurbar, India has also been done. With us results reveal that between the all 3 brand products anyway of Mefac shows highest percent assay 105.48% while mefacid shows lowest value for percentage assay 95.48% and in all brands of Paracetamol Parawal-500 shows highest percent assay 106.66% T-98 shows lowest percent assay 98.66% & Furosemide Frusenex shows greatest percentage assay of 104% while Furosemide demonstrates lower critical for percentage assay 95%. The part of its success excellent reliability inside the variety of 6.25-100 µg/ml with all brands of Mefenamic acid and Furosemide to correlation coefficient of 0.999. The recovery among all brand products of Mefenamic acid, Paracetamol and Furosemide was > 90%. The dilution and assay method perform in water and NaOH as a solvent.



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INTRODUCTION

Mefenamic acid & Paracetamol is used as antipyretic, analgesic and anti-inflammatory. The antipyretic, analgesic and anti-inflammatory effect of paracetamol is due to inhibiting prostaglandin synthesis cyclooxygenase-1 and cyclooxygenase-2.

Furosemide is most frequently were using made of high quality loop diuretics being used in clinical practice [1-3]. Numerous analytical methods were reported for the determination of paracetamol in pharmaceuticals such as, Spectrophotometric, chromatographic volumetric electrochemical in addition to polarography. Because PCM is being increasingly used for therapeutic purposes, its determination and quality control are of vital importance and one of the determining techniques most frequently used in pharmaceutical analysis is UV - VIS spectrophotometry [Figure 1, Figure 2 & Figure 3] [4-6].

MATERIALS AND METHODS

Material: Mefenamic acid, Paracetamol, furosamide, NaOH, distilled water.

Apparatus: UV-Visible spectrophotometer (shi-

Table 1: List of Sample Under Study

Tablet sample	Brand name	Company	Country	Mean of tablet in (mg)	Rsd n=20
Mefenamic acid	Meftal-250 DT [®]	Blue Cross Pharmaceutical Ltd	India	410	2.62
	Meftal-250 DT [®]	Floret Pharmaceutical Ltd	India	417	1.45
	Mefac [®]	P & B Pharmaceutical Ltd	India	401	2.05
Paracetamol	T-98 [®]	Mankind Pharma Ltd	India	592	1.92
	Prawal-500	Wallace Pharmaceutical Ltd	India	544	1.72
	Crocin	Glaxo Smithkline	India	576	1.93
Furosemide	Lasix [®]	Sanofi India	India	160	2.56
	Frusenex [®]	Geno Pharmaceuticals Ltd	India	163	3.0
	Furosemide [®]	Cord Healthcare Ltd	India	159	1.88

Table 2: Absorbance of Different Brands of Mefenamic acid Paracetamol and Furosemide

Conc. Ppm	Mefenamic acid			Paracetamol			Furosemide		
	Meftal-250 DT	Mefacid	Mefac	T-98	Parawal-500	Crocin	Lasix	Frusenex	Furosemide
100	0.54	0.58	0.6	0.65	0.57	0.61	0.572	0.6	0.54
50	0.27	0.37	0.34	0.42	0.42	0.42	0.36	0.33	0.34
25	0.13	0.16	0.15	0.19	0.28	0.28	0.15	0.18	0.21
12.5	0.07	0.08	0.09	0.08	0.19	0.19	0.07	0.097	0.11
6.25	0.02	0.034	0.04	0.035	0.06	0.06	0.02	0.05	0.08

Table 3: % Assay, Regression Equation and r² of Different Brands of Mefenamic Acid, Paracetamol and Furosemide

Tablet sample	Brand name	Average weight of tablet in mg	Absorbance	% Assay	Regression Equation	r ²
Mefenamic acid	Meftal-250 Dt	410	0.56	96%	Y=0.006x+0.011	0.994
	Mefacid	417	0.55	95.40%	Y=0.005x+0.016	0.977
	Mefacid	401	0.61	105.48%	Y=0.005x+0.006	0.999
Paracetamol	T-98	592	0.53	98.66%	Y=0.006x+0.017	0.973
	Parawal-500	544	0.56	104.42%	Y=0.005x+0.111	0.91
	Crocin	576	0.55	102.56%	Y=0.005x+0.076	0.931
Furosemide	Lasix	160	0.56	96.50%	Y=0.005X+0.004	0.977
	Frusenex	163	0.6	104%	Y=0.005x+0.026	0.997
	Furosemide	159	0.55	95%	Y=0.004x+0.063	0.999

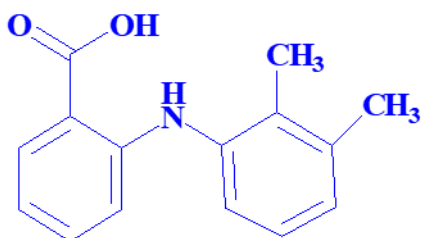


Figure 1: Mefenamic acid (IUPAC NAME: 2-(2,3-Dimethyl aniline) benzoic acid)

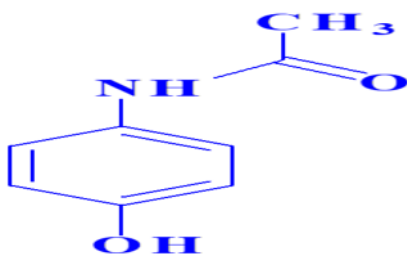


Figure 2: Paracetamol (IUPAC NAME: (4-hydroxyphenyl) acetamide)

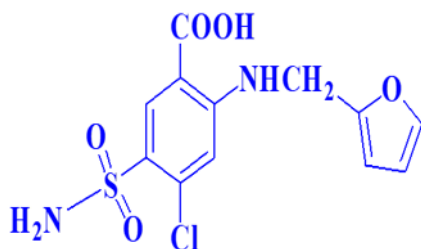


Figure 3: Furosemide (IUPAC NAME: -5-(aminosulphonyl)-4-chloro-2-[(2-furanylmethyl] amino) benzoic acid)

madzu1800), weight balance, volumetric flask, filtration assembly etc.

Experimental Design

UV visible 1800 Shimadzu double beam spectrophotometer had been used it to measure spectroscopic. The liquid that are used again for assay had been liquid.

Wavelength Selection

Regarding 100 ppm of mefenamic acid as well as furosemide remedy was precisely able to prepare in liquid. These solutions were searched inside the 200-400nm UV areas. The light spectrum maximum values (λ -max) have been noted at 288nm and 276nm including both this wavelength was embraced for absorption spectrum measuring device. For wavelength selection for Paracetamol regarding 100 ppm of paracetamol solution was accurately prepared in 0.1N NaOH. Its wavelength had been noticed at 257nm and this frequency range had been embraced for absorbance measuring system [7].

Standard Stock Solution

Weighed accurately 10 mg of mefenamic acid and furosemide standard had been transmitted to the volumetric flask and got to add adequate water to supply 100 ml 0.1N NaOH use as a solvent for the preparation of paracetamol standard stock solution.

Sample Preparation

The three different brands mefenamic (mefal250 DT, Mefac, Mefacid) and furosemide (Lasix, Frusenex, and Furosemide) were bought from various medical store Akkalkuwa, Dist-Nandurbar, (MS) India. All tablets of each brand have same batch number and were labelled to contain Mefenamic acid 250mg and furosemide 10mg per tablet [Table 1].

20 tablets of three different brand products from of the marketed sample were assessed and squashed evenly with assist of a pestle and mortar. By assessing the typical did weigh test powder similar to 10 mg of Mefenamic acid was transmitted into the flasks usually contains 10ml water. The remedies have been samples treated for around 5 min and then after make up the volume to 100 ml with water.

Procedure

Now since obtained from the standard and tablet solutions, confidence of solution 10 mg in 100 ml absorbance of the specimen preparation and basic time to prepare in 1cm at the wavelength of amount of light absorbed at almost of absorption peak at almost 288nm for mefenamic acid, 257 for paracetamol and 276nm for furosemide that used a spectrophotometer, to use the blank had been assessed [8].

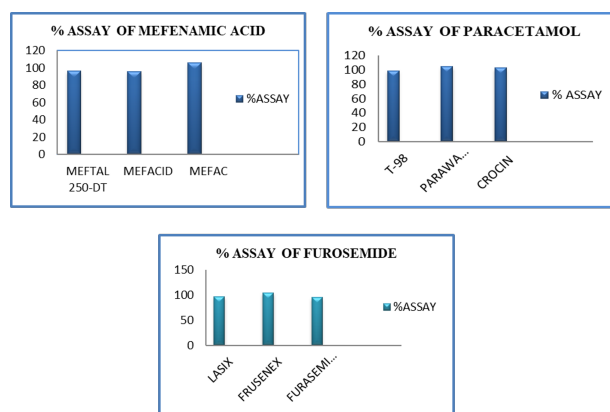


Figure 4: % Assay of Mefenamic Acid, Paracetamol, Furosemide

RESULTS AND DISCUSSION

The measurement was carried out by using UV spectrophotometer on every 3 brand products

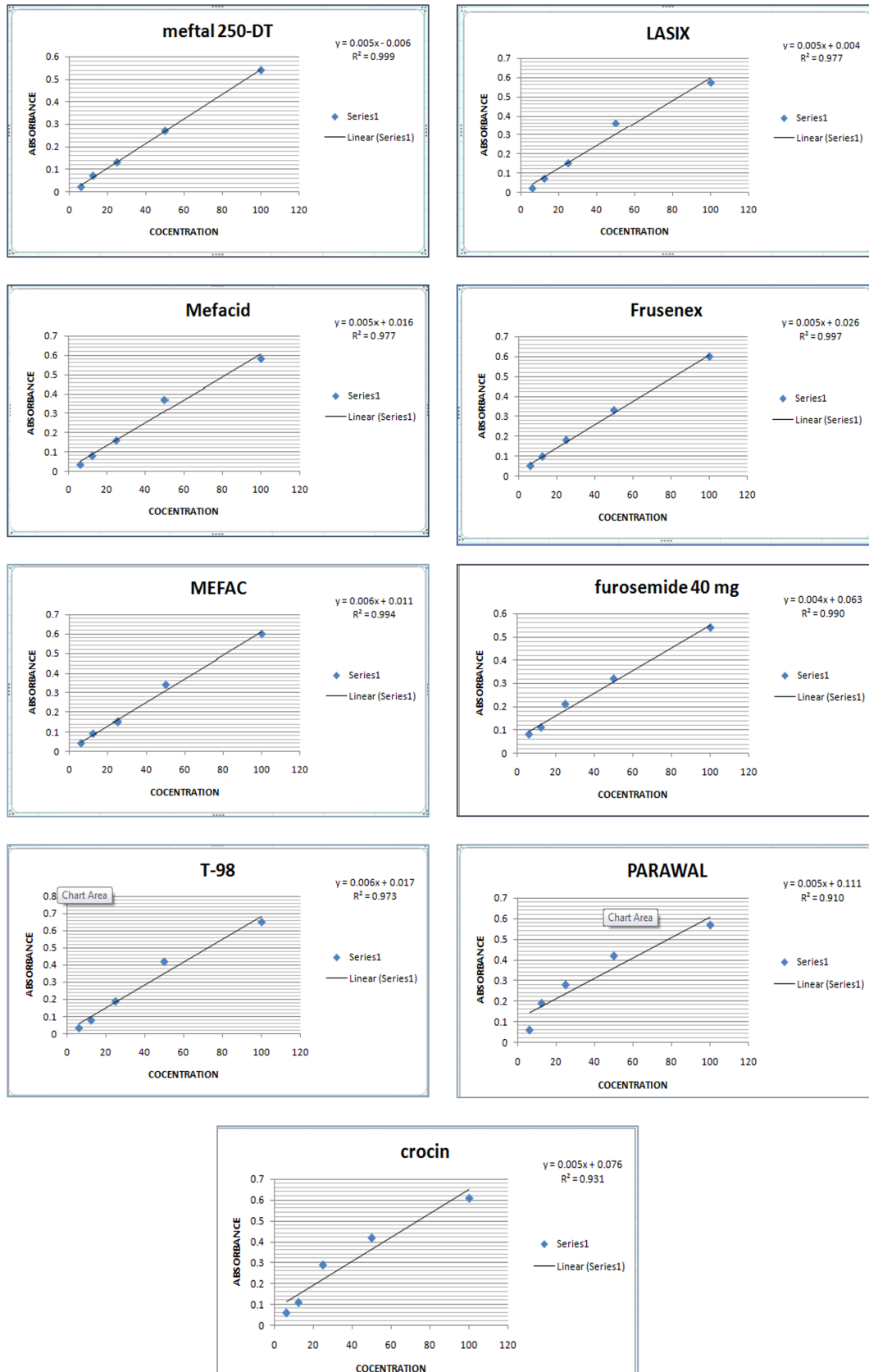


Figure 5: Linearity of Meftal250-dt, Lasix, Mefacid, Frusenex, Mefac, Furosemide, T-98, parawal-500 and Crocin

of Mefenamic acid, Paracetamol and Furosemide tablets although research. The mean average weight of different brands of tablet and relative standard deviation (RSD) [Table 1]. The absorbance of all brands of different drugs at different ppm concentration [Table 2]. The % assay, regression equation & r^2 of various labels [Table 3]. Our result expose that among all three brands of Mefenamic acid, Mefac shows highest percentage assay 105.48%, Meftal show 96% and Mefacid 95.48% which is showing lowest value of percentage assay. For Paracetamol Crocin shows highest percentage assay 104.42%, Parawal show 102.56% and T-98 shows 98.66% which is showing lowest value of percentage assay. For Furosemide Frusenex shows highest percentage assay 104%, Lasix show 96.5% and Furosemide 95% which is showing lowest value of percentage assay [Figure 4]. The strategy showed some good linear relationship inside the wide variety of 6.25-100 $\mu\text{g/ml}$ with all labels of Mefenamic acid, Paracetamol and Furosemide with correlation coefficient of 0.999. The retrieval among all labels of Mefenamic acid, Paracetamol and Furosemide was >90%. The regression equation with R^2 value which is in between 0.90-0.99 [Table 3].

Selectivity and Specificity

The strategy was formed through study of resolution component of a peak of each product from those of excipients. It was discovered to also be freed from intervention from the excipients in use in preparation products and thus the technique is specific for individual along with combine drug.

Accuracy and Recovery

There is no significance difference between the amounts of drug recovered. Thus excipients did not interfere with the estimation [Table 3].

Range and Linearity

It shows the linear interpolation statistic of intensity analysis response, the standard deviation of the analytical variance of a linear regression as well as the analytical linear range the regression line and the optimum linear range (6.25-100 $\mu\text{g/ml}$) and were discovered to also be sequential inside the quantitative varies [Figure 5]. All the analyzed drug related using a linear regression outstanding linear relationship had been acquired throughout all instances to correlation coefficients [Table 3].

CONCLUSION

In all three different brands of Mefenamic acid, Paracetamol and Furosemide following result was obtained. For Mefenamic acid, Mefac shows highest percentage assay 105.48%, Meftal 250-DT show

96% and Mefacid shows 95.48% which is showing lowest value of percentage assay, for paracetamol Perawal-500 shows highest percentage assay 104.46%, Crocin shows 102.56% and T-98 shows 98.66% which is lowest value of percentage assay & for Furosemide Frusenex shows highest percentage assay 104%, Lasix show 96.5% and Furosemide 95% which is showing lowest value of percentage assay. Available local market, give information about these products, comply with the provisions of IP standard method.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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