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FORMULATION AND EVALUATION OF ORODISPERSIBLE LIQUISOLID COMPACTS OF MELOXICAM USING BANANA POWDER AS A NATURAL SUPERDISINTEGRANTS

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ABSTRACT

The aim of the present study was to enhance the dissolution of a practically insoluble Meloxicam by liquisolid compact technique. Liquisolid compact is one of the most promising and new techniques, which promotes dissolution rate of water-insoluble drugs. Orodispersible liquisolid compact of Meloxicam were prepared by direct compression method using PEG 600, MCC and silica gel as non-volatile solvent, carrier, coating material respectively and Banana powder as natural superdisintegrants in different concentration 2.5 mg, 5 mg, 7.5 mg, 10 mg respectively. The liquisolid compact were characterized by X-ray powder diffraction, DSC and FT-IR respectively. Orodispersible liquisolid compacts of Meloxicam tablets (F4) containing banana powder exhibit quick disintegration time and maximum drug release.

KEYWORDS

Liquisolid compact, Meloxicam, Carrier, Coating and Poorly soluble drug.

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INTRODUCTION

In order to improve ease of drug administration, fast disintegrating tablets are widely accepted commercially. Fast or rapid disintegrating tablets include fast dissolution, quick disintegration and results in fast absorption which provide rapid onset of action. Moreover, drug candidates that undergo pre-gastric absorption may show increased oral bioavailability. Fast dissolving tablets provide accurate dosing, easy manufacturing and good stability[1]. Literature reports various methods of

enhancing the dissolution characteristics of slightly water-soluble drugs. Solubility is the most important critical parameter of drug for its oral bioavailability. For poorly soluble and highly permeable (Class II) drugs, the absorption is rate limited by dissolution. For such type of drugs whose absorption is dissolution rate limited, suitable changes should be done in the formulation. Many technological methods are available for enhancing the dissolution characteristics of slightly water-soluble drug, out of them; Liquisolid system was one of the most promising techniques to improve the dissolution rate of poorly soluble drugs.

The concept of liquisolid system involves the conversion of liquid lipophillic drugs and water insoluble drugs dissolved or suspended in suitable nonvolatile solvents, into acceptably flowing and compressible powders and such liquid systems converted into free-flowing, non-adherent, dry looking, and readily compressible powders with use of carrier and coating materials[2].

Meloxicam, [4-hydroxy-2 methyl-N-(5-methyl-2-thiazolyl)-2H-1, 2 benzothiazine-3-caboxamide 1, 1-dioxide], is a potent COX II selective non-steroidal anti-inflammatory drug belongs to oxicam derivatives used in the treatment of rheumatoid and osteoarthritis. It is practically insoluble in water (12 $\mu g.ml^{-1}$). A primary advantage of the oxicam family of drugs is their long half-life which permits once-day dosing. In gastric disease, lower dose of Meloxicam is required 7.5 mg/day. Meloxicam is safer than other NSAID's[3].

Hence, the present study deals with the dissolution enhancement of Meloxicam by liquisolid technique and also an attempt would be planned to formulate fast dissolving tablets of Meloxicam, a poorly water soluble drug for rapid disintegration and rapid onset of action in the pain management, using natural superdisintegrants. Since, synthetic superdisintegrants are expensive, have environment related issues, need long development time for synthesis. However, the use of natural superdisintegrants in pharmaceutical application is attractive because they are economic, readily available, non-toxic and biodegradable.

MATERIALS AND METHOD

Materials

Meloxicam (Dr. Reddy's Pharmaceutical Ltd, Hyderabad, India.), MCC (S D fine chemical Ltd, Mumbai), Silica gel (S D fine chemical Ltd, Mumbai), PEG 600 (S D fine chemical Ltd, Mumbai), Banana powder (Indiamart Pvt, Ltd), Psyllium husk (Abbott Pvt, Ltd), Lactose (S D fine chemical Ltd, Mumbai), Magnesium stearate (S D fine chemical Ltd, Mumbai), Talc (S D fine chemical Ltd, Mumbai).

Methods

Compatibility studies

Drug excipients compatibility studies by FT-IR

Compatibility studies of pure drug and excipients were carried out using Fourier transformed infrared spectrophotometer (Shimadzu, Japan) in the range of 400 - 4000/cm by KBr disc method. A base-line correction was made using dried potassium bromide and then the spectrum of the pure Meloxicam, physical mixture (drug/excipients) and liquisolid system were obtained.

Solubility studies for the selection of non-volatile solvents

Solubility studies were conducted for the selection of high solubility of the pure drug in the non-volatile solvents. For the purpose, pure drug was dissolved in different non-volatile solvents. Excess amounts of pure drug were added to the non-volatile solvents, followed by saturation solution transfer to an orbital shaker for 48 hrs at 25 ˚C. After 48 hrs, the saturated solutions were filtered and analyzed by UV-spectrophotometer at 362 nm. Important data related to solubility are given in Table No.1.

Calculation of loading factor

Loading factors were calculated for carriers, for the non-volatile solvents PEG 600. By using Lf = W/Q formula (W: Amount of liquid medication and Q: Amount of carrier material), the drug loading factors were obtained and used for calculating the amount of carrier and coating materials in each formulation.

Characterization of Liquisolid compacts

Differential Scanning Calorimetric analysis (DSC)

They study was performed using DSC model (Mettler DSC 823, Germany). For this study, the

samples were placed in a platinum crucible and the thermograms were recorded at a heating rate of 10 ˚C/min in the range of 20 ˚C to 310 ˚C.

X-Ray diffraction (XRD) study

The X-ray diffraction pattern of the selected Liquisolid compacts was compared with that of the pure Meloxicam. This was done by measuring 2ϕ in the range of 4 to 50˚ with reproducibility of ±0.001 ˚ on a diffractometer (Rigaku Co. Tokyo, Japan). The XRD patterns were recorded automatically using rate meter with constant of 2×10^2 pulse /sec and with the scanning speed of 2 ˚ (2ϕ)/min.

Estimation of drug content

The quantities of liquisolid compacts equivalent to 7.5 mg of Meloxicam were dissolved in pH 7.4 phosphate buffer. The appropriate dilutions were made and analyzed at 362 nm using spectrophotometer. The % drug content of the liquisolid compacts was calculated.

Dissolution studies of Meloxicam and its Liquisolid compacts

The dissolution study of liquisolid compacts (equivalent to 7.5 mg Meloxicam) and pure drug was performed using USP XXIV apparatus with 900 ml of phosphate buffer pH 7.4. The stirring speed employed was 50 rpm, and the temperature was maintained at 37±0.5 ˚C. Five ml aliquots of dissolution medium was withdrawn at predetermined time intervals and replaced by 5 ml of fresh dissolution medium. The filtrates of the samples were analyzed for the content of drug by UV spectrophotometer at 362 nm. Cumulative percent drug released was determined at each time point.

Preparation of orodispersible liquisolid compacts of Meloxicam tablets

Liquisolid compacts of Meloxicam were prepared by dispersing the drug in dissolution enhancing agent PEG 600. Microcrystalline cellulose was added as carrier and silica as coating material (R=10). Superdisintegrants (banana powder) in different concentration of 2.5%, 5.0%, 7.5%, 10% were used. Superdisintegrants was added both 50% intra and 50% extra granularly. Powder damp mass was passed through sieve no.80 to obtain granules and granules were dried at 45 ˚C for period of 12 hrs. Magnesium stearate and lactose were mixed with granules as a glidant and lubricant respectively finally granules were compressed using manual tabletting machine at constant compression force to obtain tables of uniform dimensions. All the formulations of orodispersible liquisolid compacts are shown in Table No.2.

Pre compression parameters

The flow properties of the powder are vital for the performance of the tablet. Hence, the flow properties of the powder were analyzed before compression to tablets. The powder mixture of different formulations were evaluated for angle of repose, bulk density, tapped density, compressibility index, Hausner's ratio, and obtained value were within the prescribed limits of IP.

Post-compression parameters[4-8]

Thickness and Hardness test

The thickness of the tablets was determined using digital caliper; reading shown was noted.

The hardness was tested by using Monsanto tester.

Friability test

The friability of the tablets was determined using Roche friabilator. The % friability was then calculated using the formula:

$$\% \text{ Friability} = \frac{\text{Initial weight} - \text{final weight}}{\text{Initial weight}} \times 100$$

Weight variation test

The test was performed as per USB by weighing 20 tablets individually on electronic balance, calculating the average weight, and comparing the individual tablet weights to the average.

***In-vitro* dispersion time**

In-vitro dispersion time was measured by following procedure. The tablet was then carefully positioned in the center of the petri dish containing 6 ml of water and the time required for the tablet to completely disintegrate into fine particles was noted. Three tablets from each formulation were randomly selected and *In-vitro* dispersion time was measured.

***In-vitro* disintegration test**

The test was carried out on 6 tablet using tablet disintegration tester. Water at 37 ± 2 ˚C was used as

a disintegration media and the time taken for complete disintegration of the tablet was noted with no palable mass remaining in the apparatus was measured.

***In-vitro* release studies**

The dissolution rate of formulations was measured in dissolution test apparatus using USB type II. Dissolution studies were carried out using 900 ml of Phosphate buffer pH 7.4 at 37±0.5 ˚C at 50 rpm. 5 ml samples were withdrawn at various time intervals and placed by 5 ml fresh phosphate buffer pH 7.4 to maintain sink condition. The solutions were immediately filtered through filter paper, diluted and the concentration of Meloxicam was determined spectrophotometrically at 362 nm.

% drug content uniformity

Twenty tablets were powdered, and 7.5 mg equivalent weight of Meloxicam in powder was accurately weighed and transferred into a 100 ml volumetric flask. Initially, 50 ml of phosphate buffer (pH 7.4) was added and shaken for 10 min. Then, the volume was made up to 100 ml with phosphate buffer. The solution in the volumetric flask was filtered, diluted suitably and analyzed spectrophotometrically at 362 nm. The drug content in each tablet was calculated using the standard calibration curve of Meloxicam in phosphate buffer pH 7.4 solution.

Wetting time[9,10]

A piece of tissue paper was folded and placed twice and placed in small petri dish containing sufficient water. A tablet was kept on the paper and the time for complete wetting of tablet was measured.

Water absorption ratio (R)[9,10]

The weight of the tablet prior to placement in the petri dish was noted (Wb). The wetted tablet was removed and reweighed (Wa). Water absorption ratio R, was then determined according to the following equation.

$$R=100 \times (Wa - Wb)/Wb$$

Where Wb and Wa are tablet weights before and after water absorption, respectively.

Stability studies[11]

Whenever a new formulation is developed, it is very essential to establish that the therapeutic activity of the drug has not undergone any change. To conform this, the selected formulations were subjected to stability studies. Accelerated stability testing studies was performed for 6 months as per ICH guidelines. The optimized formulations were kept at 40±2 ˚C and 75±5% RH. Tablets were evaluated for physical appearance, hardness, *In-vitro* dispersion time, % drug content and % drug release.

RESULTS AND DISCUSION

Drug polymer compatibility by FTIR studies

The spectrum of pure Meloxicam was represented in figure 1 and showed the characteristic peaks of the drug at: O-H stretching: 3288.74 cm-1, C-H stretching: 2912.61 cm-1, S=O stretching: 1047.38 cm-1, C=O stretching: 1618.33 cm-1, O=C–NH: 1537.32. The FTIR spectrum of physical mixture of Meloxicam and excipients (figure 1,2) also showed the characteristics peak of Meloxicam, indicating that there was no interaction between drug-excipients used in the study.

It is observed that the peaks of major function groups of Meloxicam, which are present in spectrum of pure drug, were present in Meloxicam liquisolid compact (Figure No.2) but the broadness of the characteristic peak of Meloxicam with shifting to lower frequency might be due to formation of hydrogen bonding between the carboxylic group of Meloxicam and the hydroxyl group of the PEG in liquisolid formula, this resulted in drug dissolution enhancement.

Vehicle selection

The solubility of Meloxicam was determined in a number of solvents and is reported in table 2. Drug solubility in a non-volatile vehicle is the most important aspect in liquisolid systems. The solubility of the drug contributes to molecular dispersion in a non-volatile solvent which will improve the dissolution rate. Based on the solubility data, PEG 600 was selected as the vehicle for Meloxicam.

Liquid load factor

Loading factors were calculated for different ratio of carriers and coating using PEG 600 as vehicle. The loading factor for the R value 5 and 10 was found to be 0.657 and 0.331 respectively and was shown in Table No.3.

Characterization of liquisolid compact

DSC

DSC of pure Meloxicam showed a characteristic, sharp endothermic peak at 270˚C corresponding to its melting point range and indicated the crystalline nature of Meloxicam (Figure No.3). But the DSC of liquisolid compact (Figure No.4) showed complete disappearance of characteristic peak of Meloxicam and this is due to the formation of drug solution in the liquisolid-powdered system, *i.e*., the drug is molecularly dispersed within the liquisolid matrix. The total disappearance of the drug melting peak indicates that drug amorphization had taken place.

XRD analysis

The X- ray diffractogram of Meloxicam (Figure No.5) exhibited several sharp peaks at different angle 14.0 θ, 16.0 θ, 18.0 θ, 27.0 θ and 28.0 θ suggested that the drug existed as crystalline material. X-ray diffraction pattern of liquisolid compacts (Figure No.6) showed disappearances of several sharp peaks of Meloxicam and only one sharp diffraction peak at 22.0 θ may be due to crystalline state MCC.

The lack of crystallinity in the liquisolid system confirmed the drug was solubilized in the liquid vehicle (poly ethylene glycol 600) *i.e.*, the drug has formed a solid solution within the carrier matrix. The amorphization or solubilization of drug in the liquisolid system may cause the marked improvement in the solubility and therefore, the dissolution rate of the drug.

Estimation of % drug content

The drug content of the liquisolid compacts LC 1 and LC 2 were found to be in the range of 91.17 - 98.6% respectively. The %drug content of LC 1 and LC 2 of Meloxicam liquisolid compact was shown in Table No.4.

Dissolution study of Meloxicam and its liquisolid compact

The LC 1 contains the carrier material and coating material at a ratio 5:1. Whereas LC 2 contain at a10:1. The *in-vitro* drug release of Meloxicam liquisolid compact (LC 2) showed (Table No.5) an increase in dissolution rate compared to Meloxicam and was shown in Figure No.7.

Evaluation of orodispersible liquisolid compacts of Meloxicam tablets

Pre compression parameters

Angle of repose of all the formulations was found to be ranging from 28.45±1.46 - 30.58±1.47, bulk density was found to be 0.42±0.02 - 0.45±0.01g/cc, tapped density was in between 0.51±0.016 - 0.55±0.012 g/cc, Carr's index was found to be within 16.22±0.43 - 17.16±0.37 and Hausner's ratio was found to be within 1.30±0.010 - 1.32±0.030. The results of angle of repose, Carr's index, Hausner's ratio indicated good flow ability of powders and reported in Table No.6 and. As the powders were free flowing, tablets produced were of uniformity weight with acceptable weight variation due to uniform filling in the die.

Post compression parameters

Tablet mean thickness was almost uniform in all the formulations. The thickness varies between 4.0±0.010 - 4.02±0.010 mm. The prepared tablets in all the formulations possessed good mechanical strength with sufficient hardness in the range of 3.33±0.25 - 3.58±0.37 kg/cm^2. The friability of all the formulated tablets of Meloxicam was found to be between 0.450 - 0.620 %. All the formulated tablets of orodispersible liquisolid compacts Meloxicam were shown the % friability within the official limits (*i.e.*, not more than 1%). Prepared tablets were evaluated for weight variation and percentage deviation from the average weight of all tablet formulation (F1 - F4) and were found to be within (±7.5) the prescribed official limits. The drug content of the prepared liquisolid tablets were found to be in the range of 98.40±1.43 - 99.23±0.39 % which is due to acceptable uniformity of content of the prepared liquisolid tablets**.** The % drug content of all the formulations of Meloxicam liquisolid tablets was shown in Table No.7.

The *in-vitro* dispersion time was found to be in the range of 36.66±1.52 - 96.66±1.52 sec. The disintegration time was found that, the mean of the disintegration times for all investigated tablets were less than 2 min, which fulfill the pharmacopoeial requirement. The disintegration time was found to be in the range 35.00±1.00 - 88.00±2.00 sec. In this study

the disintegrating effect of banana powder was studied by changing different concentration. From the results it was concluded that as the polymer concentration was increased, the disintegration time was reduced. The formulation F1 with 2.5 mg banana powder showed 88.00±2.00 sec and with 10 mg banana powder for formulation F4 showed lesser disintegration time of 35.00±1.00 sec. The results also suggested that banana powder showed faster disintegration time, due to the rapid uptake of water from the medium, swelling and burst effect. The wetting time of tablets was in the range 1.55±0.45 - 2.88±0.23 min, which complies with the official specifications. The water absorption ratio for prepared formulation F1 - F4 was found to be in the range 65.15±0.89 - 85.59±0.86 %, The obtained results were showed in Table No.8.

***In-vitro* dissolution study**

All the Meloxicam liquisolid formulations were subjected to *in-vitro* dissolution studies in pH 7.4 buffer and the results were shown in the Table No.9. The banana powder was studied for their superdisintegrating effect. The formulations F1 - F4 were formulated with the help of banana powder in concentration 2.5 mg, 5 mg, 7.5 mg, 10 mg.

The *in-vitro* release of orodispersible Meloxicam liquisolid tablets were found to vary according to the type and ratio of polymer used. The release of Meloxicam was increased with increasing concentration of banana powder. The percentage of the drug released from the formulations F1, F2, F3, F4 was found to be 91.24±0.69%, 94.69±0.48%, 96.86±0.59%, 100% respectively. More than 80% of the drug was released within 20 min for all the formulation and more than 90 % release was achieved with in 30 min for all the formulation. Among the different formulation the F4 which contain the 10 mg banana powder achieved more than 90 % drug release within 20 min. These results suggested that banana powder have faster disintegrating and dissolution effect.

Various dissolution parameters values *viz.*, Percent drug dissolved in 5 and 10 min (DE_5 and DE_{10}), time taken to dissolve the 50%, 70% and 90% drug (t_{50}, t_{70}, t_{90} respectively) were given in the Table No.10. From the results it was observed that percent drug dissolves was increased by increasing the concentration of superdisintegrants and t_{50}, t_{70}, t_{90} values decreased with increase in the concentration of banana powder. From the dissolution parameter it was evident that the formulation F4 achieved maximum dissolution efficiency of 46.68±1.55 for DE_5 and 63.90±1.26 for DE_{10} and lowest t_{50}, t_{70}, t_{90} values of 6.00 min, 11.48 min and 20.12 min respectively.

Stability studies

Accelerated stability studies for the optimized tablets formulation F4 were carried out at a temperature of 40±2 ˚C and 75±5% RH for a period of 6 months. Tablets were evaluated for physical appearance, hardness, *In-vitro* dispersion time, % drug content and % of drug release. The results are shown in Table No.11. Tablets have not shown any significant change during storage. Hence, it was concluded that the optimized tablets have good stability during their shelf life.

Table No.1: Formulation design for preparation of orodispersible liquisolid compact of Meloxicam using natural superdisintegrants

S.No	Ingredients (mg)	F1	F2	F3	F4
1	Meloxicam	7.5	7.5	7.5	7.5
2	PEG - 600	0.80	0.80	0.80	0.80
3	MCC	60.0	60.0	60.0	60.0
4	Aerosil	6.0	6.0	6.0	6.0
5	Banana powder	2.5	5.0	7.5	10.0
6	Lactose	119.2	116.7	114.2	111.7
7	Magnesium stearate	2.0	2.0	2.0	2.0
8	Talc	2.0	2.0	2.0	2.0

Table No.2: Solubility of Meloxicam in different non-volatile solvents

S.No	Solvents	Solubility(mg/ml)
1	Propylene glycol	2.65
2	Polyethylene glycol 400	4.87
3	Polyethylene glycol 600	11.47

Table No.3: Liquid load factor

S.No	Liquid vehicles	Drug concentration in liquid medication	carrier and coating material ratio	Liquid load factor
1	PEG 600	15 % w/v	1:5	0.657
2	PEG 600	15 % w/v	1:10	0.331

Table No.4: Estimation of % drug content of liquisolid compacts

S.No	Drug content (%)	
	LC 1 (5:1)	LC 2 (10:1)
1	91.17	98.6

Table No.5: Dissolution data of liquisolid compacts and pure drug

S.No	Time (min)	% CDR		
		Pure drug	LC 1 (5:1)	LC 2 (10:1)
1	0	0	0	0
2	0.25	6.23	6.92	07.45
3	0.5	7.93	14.50	19.92
4	1	9.31	21.12	27.94
5	2	13.58	32.70	34.10
6	5	17.59	41.2	45.20
7	10	19.47	57.4	68.30
8	15	23.34	68.51	79.30
9	30	26.29	79.43	90.60

Table No.6: Pre compression parameters

S.No	Formulation	*Bulk density g/cc	*Tapped density g/cc	*Carr's index	*Haunser ratio	*Angle of repose ˚C
1	F1	0.43±0.01	0.52±0.012	16.22±0.43	1.30±0.010	28.45±1.46
2	F2	0.42±0.02	0.51±0.016	16.84±0.60	1.31±0.034	30.58±1.47
3	F3	0.44±0.03	0.55±0.012	17.16±0.37	1.31±0.011	28.95±1.31
4	F4	0.45±0.01	0.55±0.012	16.46±1.25	1.32±0.030	29.61±1.23

*****Mean ±SD, n=3

Table No.7: Post compression parameters of orodispersible liquisolid compacts tablets

S.No	Formulation	**Hardness Kg/cm^2	Friability %	*Thickness mm	***% weight variation	#% drug content
1	F1	3.41±0.20	0.490	4.01±0.022	0.014±0.37	99.07±0.46
2	F2	3.33±0.25	0.620	4.01±0.012	0.047±0.49	98.61±0.84
3	F3	3.58±0.37	0.450	4.01±0.014	0.048±0.43	99.23±0.39
4	F4	3.50±0.44	0.510	4.02±0.010	0.022±0.52	98.40±1.43

Mean ±SD, n=3, * Mean ±SD, n=4, ** Mean ±SD, n=6, *** Mean ±SD, n=20.

Table No.8: Results of *In-vitro* dispersion time, wetting time and water absorption ratio of orodispersible Meloxicam tablet

S.No	Formulation	**In-vitro* dispersion time (sec)	**Disintegration Time (sec)*	**Wetting time (min)*	**Water absorption Ratio (%)*
1	F1	96.66±1.52	88.00±2.00	2.88±0.23	65.15±0.89
2	F2	59.00±1.00	62.33±2.51	2.53±0.58	66.31±0.91
3	F3	48.33±1.15	49.33±1.52	2.14±0.16	79.56±1.70
4	F4	36.66±1.52	35.00±1.00	1.55±0.45	85.59±0.86

*****Mean ±SD, n=3

Table No.9: *In-vitro* release study of formulation F1-F4

S.No	Time (min)	% CDR			
		F1	F2	F3	F4
1	0	0	0	0	0
2	0.25	07.70±0.34	09.22±0.58	07.10±0.64	09.18±0.44
3	0.5	11.71±0.34	22.92±0.41	09.35±1.03	11.54±0.62
4	1	14.50±0.95	33.94±1.23	13.40±0.88	17.73±0.37
5	2	19.74±0.43	44.44±0.64	27.18±0.91	25.11±1.00
6	5	31.70±0.70	56.65±1.05	59.33±1.42	46.68±1.55
7	10	42.11±1.29	58.35±1.07	63.60±0.86	63.90±1.26
8	15	49.48±1.07	71.75±0.61	77.25±0.86	83.68±0.45
9	20	70.40±1.01	85.14±0.59	87.91±0.38	98.05±0.33
10	30	91.24±0.69	94.69±0.48	96.86±0.59	100

Table No.10: *In-vitro* dissolution parameters

S.No	Formulation code	DE_5 (%)	DE_{10} (%)	t_{50} (%)	t_{70} (%)	t_{90} (%)
1	F1	31.70±0.70	42.11±1.29	15.12	20.00	23.48
2	F2	56.65±1.05	58.35±1.07	3.24	14.00	20.12
3	F3	59.33±1.42	63.60±0.86	4.12	12.24	23.48
4	F4	46.68±1.55	63.90±1.26	6.00	11.48	20.12

Table No.11: Accelerated stability study of optimized F4 formulation

S.No	Storage condition	Evaluation Parameters	Duration in month		
			0	3	6
1	40±2 °C and 75%±5% RH	Hardness	3.66±0.25	3.66±0.25	3.66±0.25
		In-vitro dispersion time	31.33±0.50	31.33±0.5	30.66±1.15
		Drug content	99.13±0.37	99.00±0.41	98.90±0.46
		% of drug release	99.02±0.56	98.98±0.59	98.68±0.50

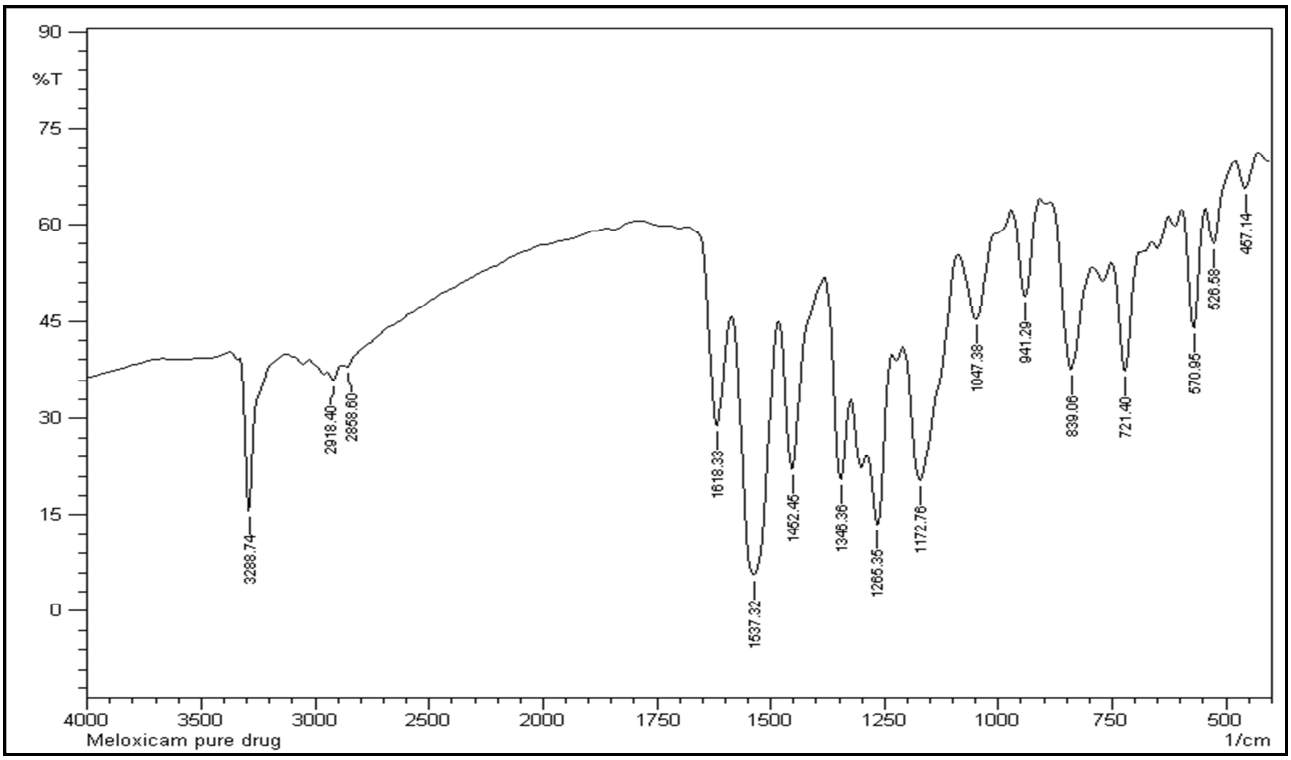


Figure No.1: FTIR spectrum of Meloxicam

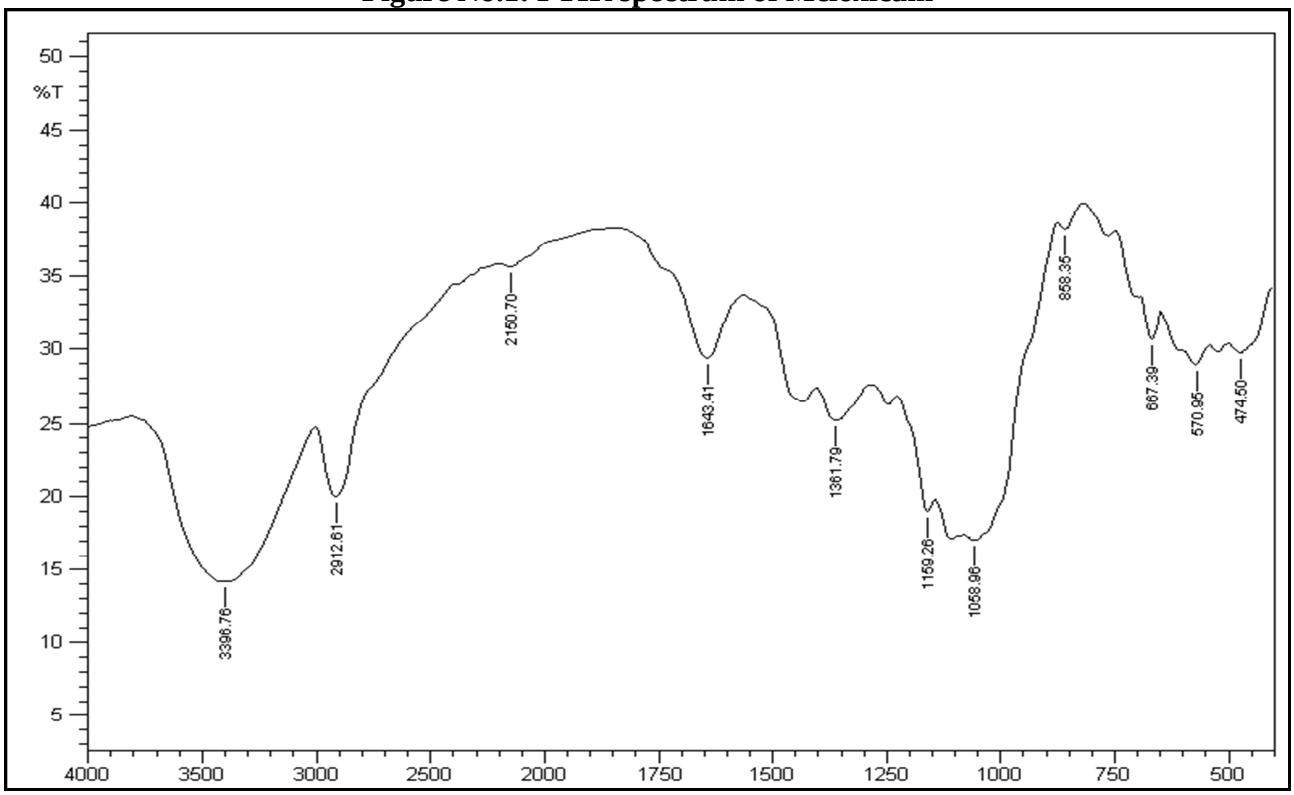


Figure No.2: FTIR spectra of liquisolid compact

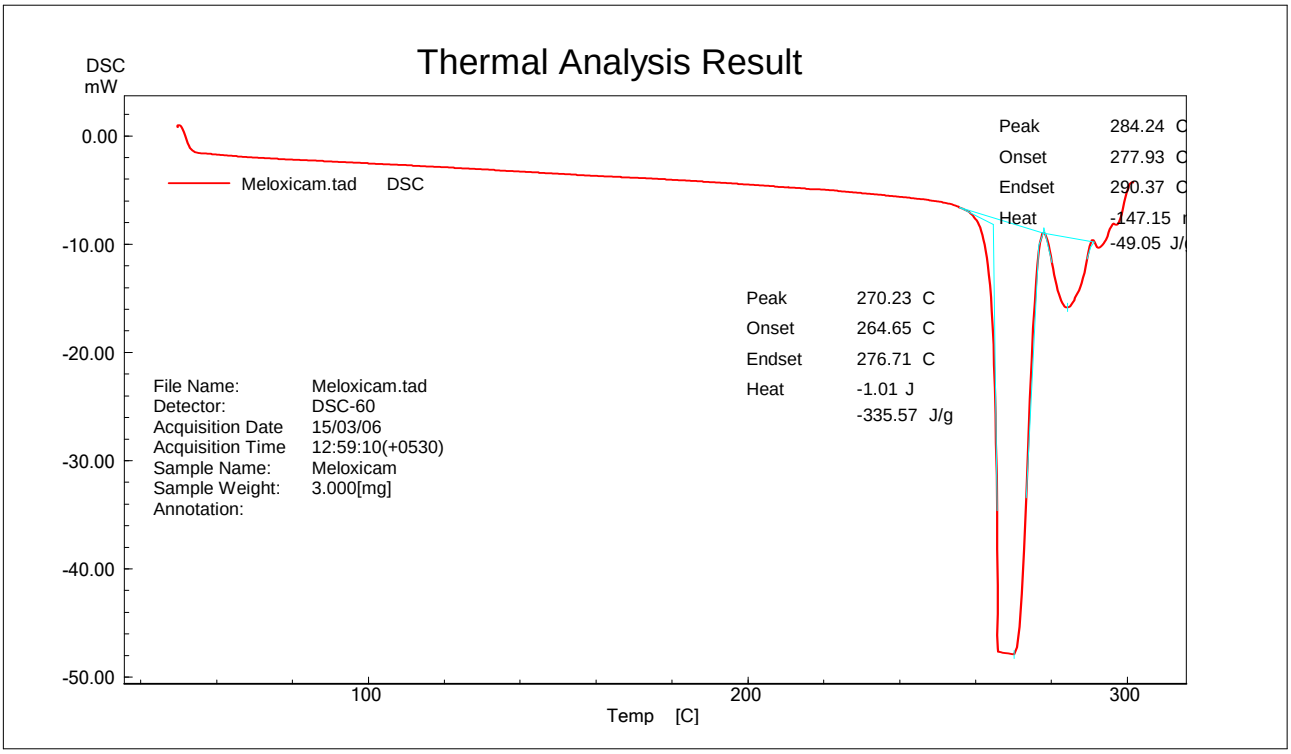


Figure No.3: DSC thermo graph of pure drug Meloxicam

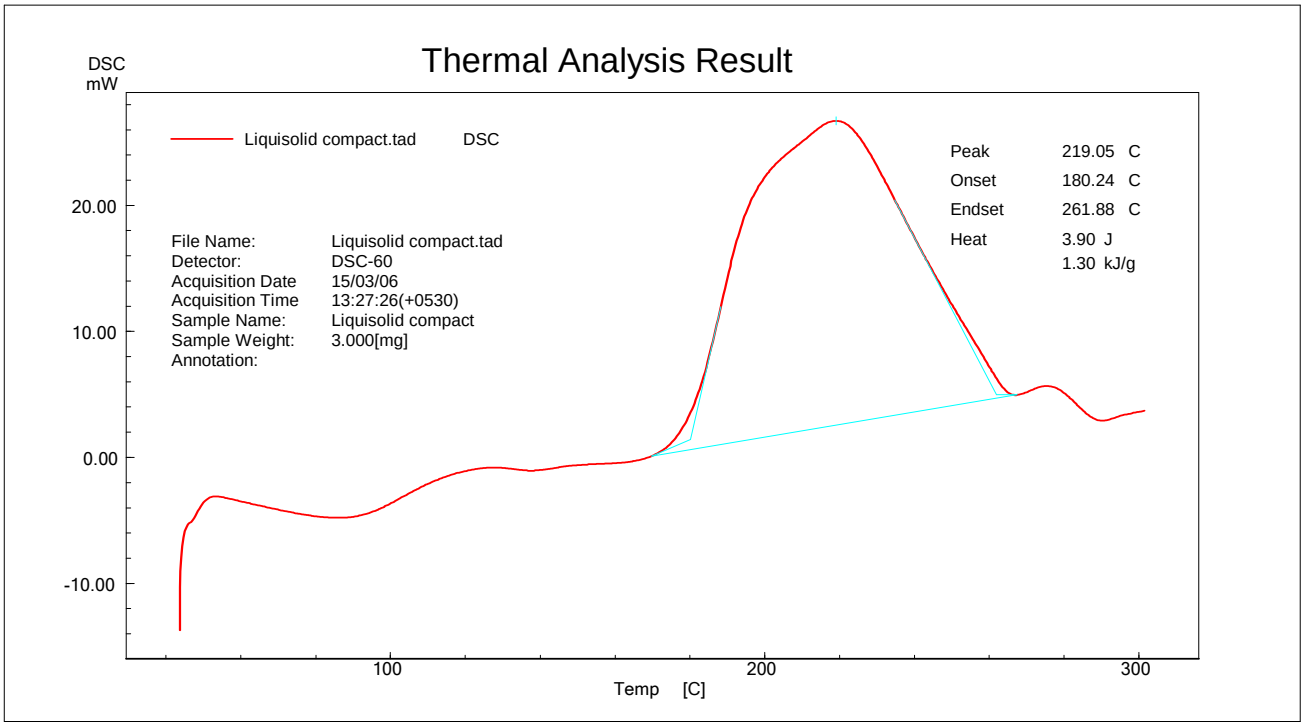


Figure No.4: DSC thermo graph of liquisolid compact

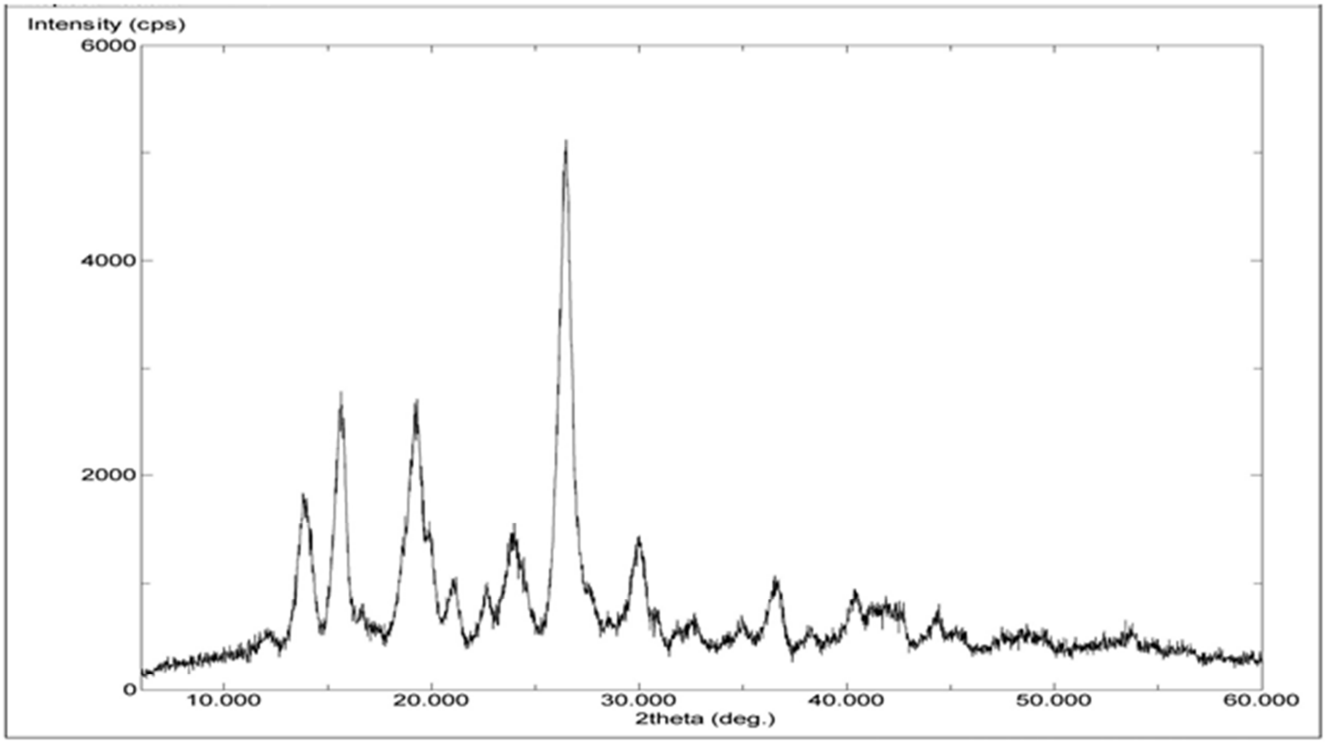


Figure No.5: X-ray graph of Meloxicam

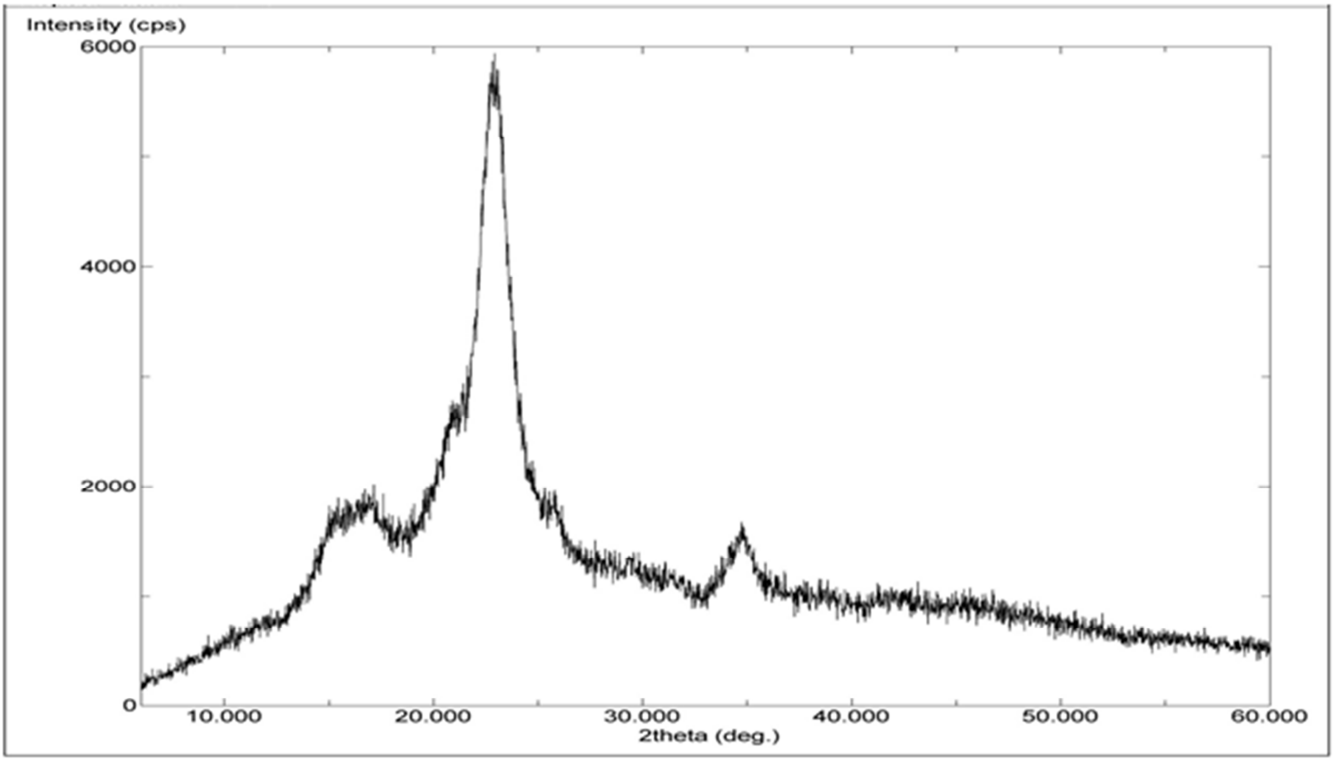


Figure No.6: X-ray graph of liquisolid compact

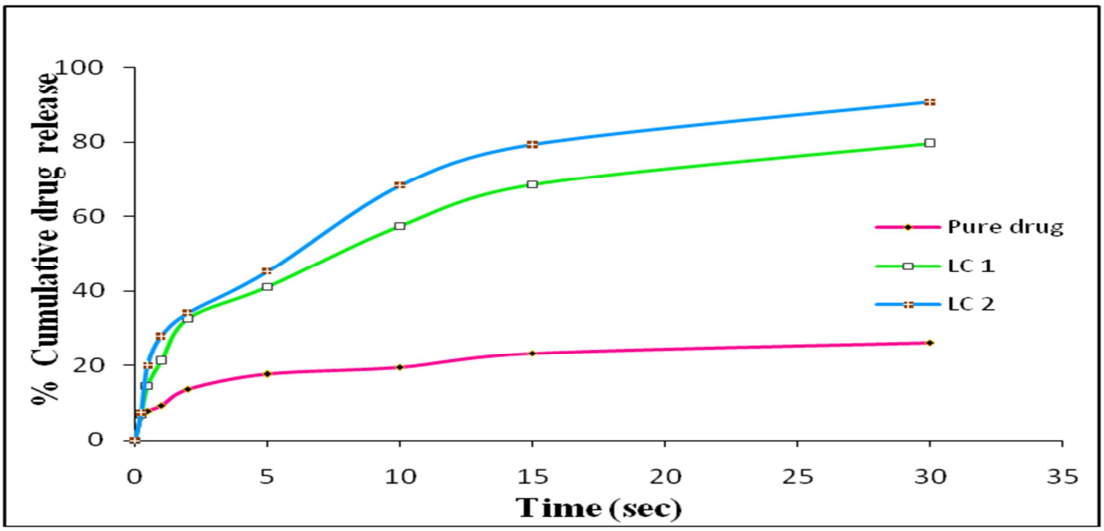
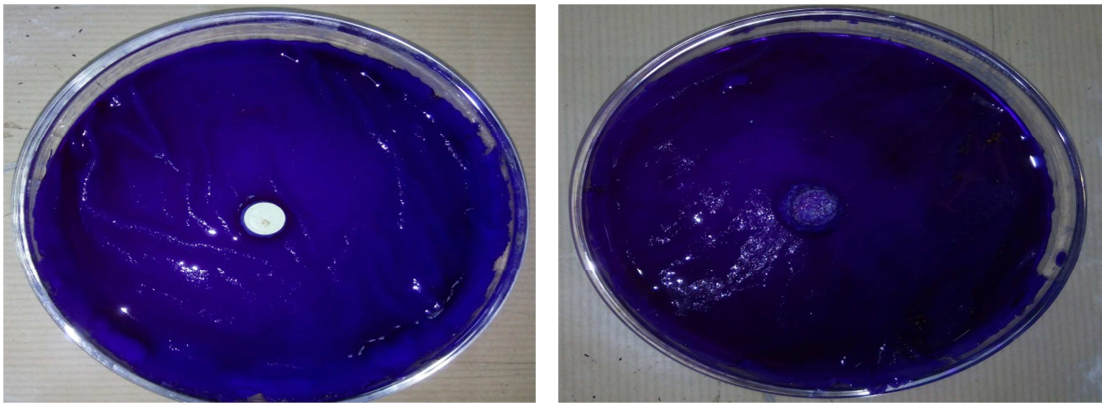
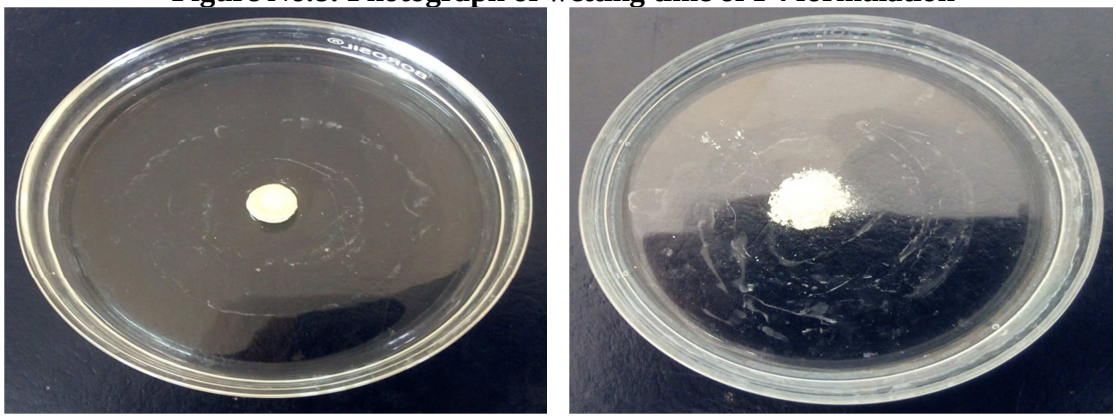


Figure No.7: Dissolution profile of liquisolid compacts and pure drug



At 0 min At 1.55 min

Figure No.8: Photograph of wetting time of F4 formulation



At 0 sec At36.66 sec

Figure No.9: Photograph of *in-vitro* dispersion time of F4 formulation

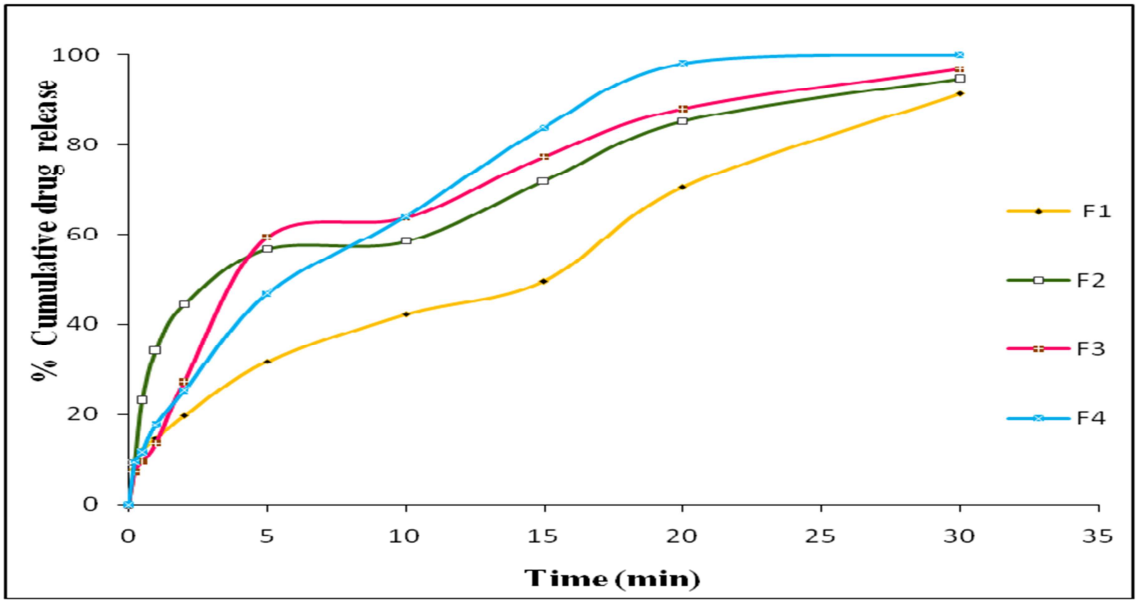


Figure No.10: *In-vitro* release profile of formulation F1-F4

CONCLUSION

Orodispersible liquisolid compacts prepared with PEG 600 and banana powder as superdisintegrants enhanced the dissolution rate of Meloxicam to a greater extent. The tablets prepared with banana powder showed highest dissolution rate. This may be attributed to rapid uptake of water with vigorous swelling ability of banana powder. Hence, liquisolid compacts and different ratio of natural superdisintegrants addition is useful technique in enhancement of dissolution rate of Meloxicam. It can be said that liquisolid technique with natural super disintegrant could be a promising strategy in improving dissolution of insoluble drugs and formulating immediate release solid dosage forms.

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CONFLICT OF INTEREST

None declared.

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