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Fabrication and Evaluation of Floating Mucoadhesive Tablets of Cefpodoxime Proxetil Using Factorial Design

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ABSTRACT

The present research work aims to fabricate and optimize gastroretentive floating mucoadhesive tablets of Cefpodoxime Proxetil, so as to remain in the gastric region for appropriate hours and hence significantly prolong the gastric residence time of drugs which improve bioavailability. Floating-Mucoadhesive tablets of Cefpodoxime Proxetil were prepared by direct compression method using various polymers such as HPMC K 200 M, Carbopol 940P. Sodium Bicarbonate & Citric acid was incorporated as a gas-generating agents and HPMC K 200 M, Carbopol 940 P was incorporated as Mucoadhesive agent. Optimization study was carried out by using 3^2 factorial design. The concentration of polymers was considered as independent variables whereas Floating lag time,Swelling Index, Mucoadhesive Strength, of the tablets were utilized as dependent variables. The floating- Mucoadhesive tablets were evaluated for weight variation, hardness, thickness, friability, drug content, in-vitro buoyancy study, and in-vitro and ex-vivo Mucoadhesive studies, swelling index and in-vitro dissolution studies. The study reveals the significant effect of the amount of polymers on Floating lag time, Swelling Index, Mucoadhesive Strength of the tablets. FTIR, DSC study indicates no drug-excipients interaction in the prepared formulations. The prepared tablets exhibited satisfactory physico-chemical characteristics. All prepared batches shown good in-vitro buoyancy studies and Mucoadhesion studies. The In-vitro dissolution profiles of optimized floating- Mucoadhesive formulation of Cefpodoxime Proxetil were found to sustained the drug release up to 12 hrs and release can be extended for longer period over 12 hrs by increasing the concentration of polymers. The best result from optimized batches is of AT5 which gives floating lag time 21±2, Mucoadhesive strength 16.60 gm & drug release 98.65% in 12 hrs. Floating- Mucoadhesive tablet were prepared and could be a promising approach to deliver Cefpodoxime Proxetil with improved gastric residence time which improve bioavailability & effective in the management of the bacterial infection.

Keywords: Cefpodoxime Proxetil, , HPMC K200M, Carbopol 940P,Floating-Mucoadhesive, factorial design

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INTRODUCTION

Dosage form means suitable form of administration of drug. Oral drug administration has been the most convenient and preferable route for drug delivery [1]. When a drug is delivered as a conventional dosage form such as a tablet, the dosing interval is much shorter than the half-life of the drug resulting in a number of limitation like the fluctuating drug levels, A typical peak-valley plasma concentration-time profile, Poor patient compliance; increased chances of missing the dose of a drug with short half-life for which frequent administration is necessary so leads in to poor patient compliancen [2]. In order to overcome the drawbacks of conventional drug delivery systems there is need of novel drug delivery like gastrointestinal drug deliveryn [3,4]. Gastro retentive drug delivery system plays a vital role among novel drug delivery systemsn [5]. The retention of oral dosage forms in the upper GIT causes prolonged contact time of drug with the GI mucosa, leading to higher bioavailability, and hence therapeutic efficacy, reduced time intervals for drug administration, potentially reduced dose size and thus patient compliancen [6,7]. Over the last two decades, numbers of GRDDS have been designed to prolong GRT. The main aim of preparing GRDDS is to minimize the problem associated with existing oral sustained release dosage form and to develop patient benefited drug deliveryn [8,9].

Gastro retentive systems can remain in the gastric region for several hours and hence significantly prolong the gastric residence time of drugs which improve bioavailability, reduce drug waste, and improve solubility of drugs that are less soluble in a high pH environment. Floating & Mucoadhesion are two mostly used approach of GRDDSn

[10]. These GRDDS approaches have some advantages & disadvantages [10,11] .

Floating system- Requirement of sufficient amount fluid in stomach as the stomach empties the tablet is at the pylorus, so the buoyancy of the dosage form affected & Mucoadhesive system- The tablet is detached from mucosa wall due to an effect of mucous turn over [12].

These disadvantages of individual approach of GRDDS can be overcome by making the floating system eventually adhere to the mucous lining of stomach wall. Thus floating and Mucoadhesive drug delivery system, thus, offers the advantage of increased gastric residence time of drugs over normal floating drug delivery system [13].

Cefpodoxime Proxetil is third generation cephalosporin antibiotic, it is a prodrug. It is active against most Gram positive and Gram negative organisms [14]. It has an oral bioavailability of only 50% and biological half life 2 hrs by enhanced gastric retention time of Cefpodoxime Proxetil in floating Mucoadhesive dosage form will increase its absorptionn [15]. The present study involves the aims to fabricate and optimize gastroretentive mucoadhesive tablets of cefpodoxime proxetil , so as to remain in the gastric region for several hours and hence significantly prolong the gastric residence time of drugs which improve bioavailability.

MATERIALS AND METHODS:

Materials: Cefpodoxime Proxetil was obtained as gift sample from Swami Samarth Ayurvedic Pharmacy Jalgaon (Alopatheics division). HPMCK 200M, Carbopol 940, Sodium Bicarbonate, Citric Acid , Magnesium stearate, Citric Acid ,and Lactose was Purchased from Research Lab Fine Chem. Ltd. Mumbai. All other ingredients used were of analytical grade.

Drug& DSC- Excipient Compatibility Study:

FTIR & DSC studies were conducted to know the compatibility between drug and excipients.

a) FTIR

FT-IR spectra for pure Cefpodoxime Proxetil and Different polymers acquired at room temperature using FT-IR spectrophotometer (FTIR-8400S, Shimadzu, Japan) in transmittance mode. The samples were ground in a mortar, mixed with Nujol and placed between two plates of KBr and compressed to form a thin film. The sandwiched plates were placed in the infrared spectrometer and the spectra were obtained. Scanning was performed between wave numbers 4000-400 cm^{-1}..

b) Differential Scanning Colorimetry Analysis

Method for estimating the physical interaction between drug and polymers used for the formulation of different dosage form is thermal analysis by DSC. In the present studies the DSC analysis of drug, and Polymers were carried out using a Shimadzu DSC 60, Japan; to evaluate any possible polymer drug thermal interaction. Exactly weighed 5 to 6 mg samples were hermetically sealed in aluminium crucible and heated at constant rate of 10°C/min over a temperature range of 40 to 300°C. Inert atmosphere was maintained by purging nitrogen gas at a flow rate of 50 ml/min.

METHODS:

Fabrication of Floating-Mucoadhesive Tablets [16,17,18]

All the floating-mucoadhesive tablets were fabricated by using direct compression technique. Drug and HPMC K 200 M, Carbopol 940 and excipients were blended homogeneously in mortar. Blended mixture was passed through Sieve 60, finally Sodium bicarbonate, citric acid and magnesium stearate was added and blended. The homogeneously blended mixture was compressed in rotary tablet press with the 09 mm rounded punch.

Optimization by using full factorial designs [19]

In the present study, a 3^2 full factorial design was employed to study the effect of independent variables, i.e. amount of ... HPMCK 200 M ...(X1) and... CARBOPOL 940... (X2) on dependent variables i.e. Floating lag time ,% Swelling index and Mucoadhesive Strength.

Table 1: Layout of 3^2 full factorial design batches of floating Mucoadhesive Tablets AT1-AT9

Batch No.	X1	X2
AT1	-1	-1
AT2	-1	0
AT3	-1	1
AT4	0	-1
AT5	0	0
AT6	0	1
AT7	1	-1
AT8	1	0
AT9	1	1

Table 2: Translation of coded value in an actual unit

Coded value	HPMCK 200 M (X1))	CARBOPOL 940(X2)
-1	40	20
0	50	30
1	60	40

Table 3: Composition of Optimization batches AT1-AT9

Ingredients (mg)	Formulation batch code								
	AT1	AT2	AT3	AT4	AT5	AT6	AT7	AT8	AT9
Cefpodoxime Proxetil	100	100	100	100	100	100	100	100	100
HPMC K-200 M	40	40	40	50	50	50	60	60	60
Carbapol 940	20	30	40	20	30	40	20	30	40
Sodium bicarbonate	40	40	40	40	40	40	40	40	40
Citric acid	10	10	10	10	10	10	10	10	10
Magnesium stearate	7	7	7	7	7	7	7	7	7
Talc	5	5	5	5	5	5	5	5	5
Lactose Q.S.	QS	QS	QS	QS	QS	QS	QS	QS	QS
Total	300	300	300	300	300	300	300	300	300

Evaluation of farbricated Floating Mucoadhesive tablets Tablets [20-28]

All prepared sustained release tablets were evaluated for the following official & unofficial parameters.

Thickness

Thickness was measured using a vernier caliper. Five tablets of the formulation were picked randomly and thickness was measured individually.

Hardness

Hardness was measured using Monsanto hardness tester. The hardness expressed in kg/cm2. For each batch three tablets were tested.

Friability

Twenty tablets were weighed and placed in the Roche friabilator and apparatus was rotated at 25 rpm for 4 minutes. After revolutions, the tablets were deducted and weighed again. The percentage friability was measured using formula,

% F = {1-(Wt. /W)} ×100 ….. (1)

Where, % F = Friability in percentage

W = Initial weight of tablets

Wt. = Weight of tablets after revolution

Weight variation

Twenty tablets were randomly selected from each batch and individually weighed. The average weight and standard deviation of 20 tablets was calculated. The batch passes the test for weight variation test if not more than two of the individual tablet weight deviate from the average weight.

Drug Content Uniformity

Ten tablets for each batch was taken and triturated. Powder equivalent to dose of drug was weighed and was transferred to breaker and 0.1N HCl was added and it was then shaken for 5 min and finally 0.1N HCl was added to make the volume up to 100 ml and solution was then sonicated for 15 min and filtered through Whatman filter paper. Finally, a solution was diluted suitably and the absorbance of the resultant solution was measured to determine the drug content spectrophotometrically at 258 nm using UV/Visible spectrophotometer Shimadzu 1800 against 0.1N HCl blank.

In-Vitro Buoyancy Studies

The in-vitro buoyancy was determined by floating lag time. The time required for the tablet to rise to the surface and float was determined as floating lag time. In this the tablets were placed in 100 ml beaker containing 0.1 N HCL.

Wash off Detachment time

The mucoadhesive properties of the tablets were evaluated by an in vitro Mucoadhesion testing method known as wash off method. Pieces of stomach mucosa were mounted on the glass slides were connected with suitable support. About 2 tablets attached on the glass slide & support was hung on the arm of USP tablet disintegration apparatus was given as slow regular up & down movement in 0.1 N HCL at $37^{0C.}$ The time of detachment of both the tablets was noted down.

Mucoadhesive Strength test

Mucoadhesive strength of the tablets were measured on the modified physical balance. The apparatus consist of a modified double beam physical balance in which the right pan has been replaced by a glass slide with copper wire and additional weight, to make the right side weight equal with left side pan. A taflon block of 3.8 cm diameter and 2 cm height was fabricated with an upward portion of 2 cm height and 1.5 cm diameter on one side. This was kept in beaker filled with buffer media 0.1N HCl pH 1.2, which was then placed below right side of the balance.

Goat stomach mucosa was used as a model membrane and buffer media 0.1N HCl pH 1.2 was used as moistening fluid. The goat stomach mucosa was obtained from local slaughter house and kept in a Krebs buffer during transportation. The underlying mucous membrane was separated using surgical blade and wash thoroughly with buffer media 0.1N HCl pH 1.2. It was then tied over the protrusion in the Teflon block using a thread. The block was then kept in glass beaker. The beaker was filled with 0.1N HCl pH 1.2 up to the upper surface of the goat stomach mucosa to maintain stomach mucosa viability during the experiments. The one side of the tablet was attached to the glass slide of the right arm of the balance and then the beaker was raised slowly until contact between goatmucosa and mucoadhesive tablet was established. A preload of 10 mg was placed on the slide for 15 min (preload time) to established adhesion bonding between mucoadhesive tablet and goat stomach mucosa. The preload and preload time were kept constant for all formulations. After the completion of preload time, preload was removed from the glass slide and water was then added in the plastic bottle in left side arm by peristaltic pump at a constant rate of 100 drops per min. The addition of water was stopped when mucoadhesive tablet was detached from the goatstomach mucosa. The weight of water required to detach mucoadhesive tablet from stomach mucosa was noted as Mucoadhesive strength in grams. Mucoadhesion strength was determined in terms of force required to detach the tablet from the membrane. Mucoadhesive strength (*F*) was in terms of the weight in grams required to detach the tablet from the membrane. The tests were repeated in triplicate for each formulation.

$$\text{Force of adhesion (N)} = \frac{\text{Mucoadhesive Strength}}{1000} \times 9.81 \quad (2)$$

Swelling Index Study

The extent of swelling can be measured in terms of % weight gain by the tablet. For each formulation batch, one tablet was weighed and placed in a beaker containing 200 ml of buffer media. After each interval the tablet was removed from beaker and weighed again up to 12 h. The swelling index was calculated using following formula.

Swelling index (S.I) = {(wt-wo) /WO} ×100

Where, S.I. = Swelling index

Wt. = Weight of tablet at time t

WO = Weight of tablet before placing in the Beaker.

In Vitro Dissolution Studies

In-vitro drug release studies of the prepared floating tablets were conducted for a period of 12 hrs. Using USP type II apparatus (paddle) at 37± 0.5°C and at 100 rpm speed at pH 1.2. After withdrawing, the samples were analysed by a UV spectrophotometer at 258nm.

Data Analysis

To analyse the mechanism of release and release rate kinetics of the dosage form, the data obtained were fitted into Zero order, First order, Higuchi matrix, Pappas and Hixson Crowell model using PCP-DISSO – v3 software. Based on the R-value, the best-fit model was selected.

RESULTS AND DISCUSSION:

FT-IR Study of Drug

FTIR analysis of Cefpodoxime Proxetil (Pure drug), Polymers & blend

The IR spectrum of pure drug was found to be similar to the reference standard IR Spectrum of Cefpodoxime Proxetil given in Indian pharmacopoeia. The IR Spectrum of Cefpodoxime Proxetil shown in figure 1.

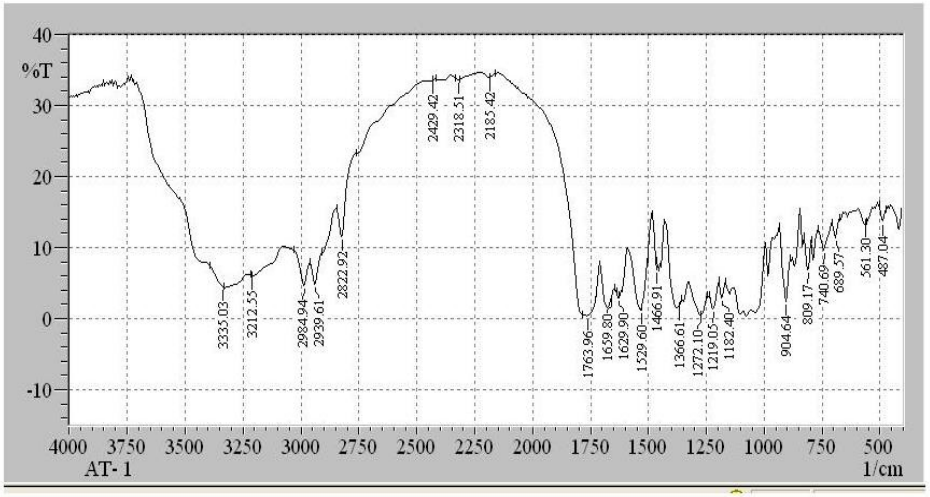

Fig. 1: FTIR spectrum of Cefpodoxime Proxetil (Pure drug)

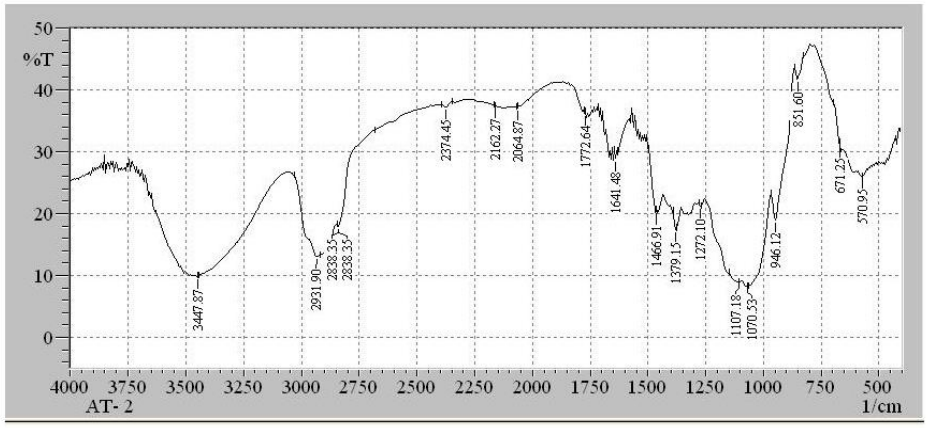

Fig. 2: FTIR analysis of HPMC K 200M

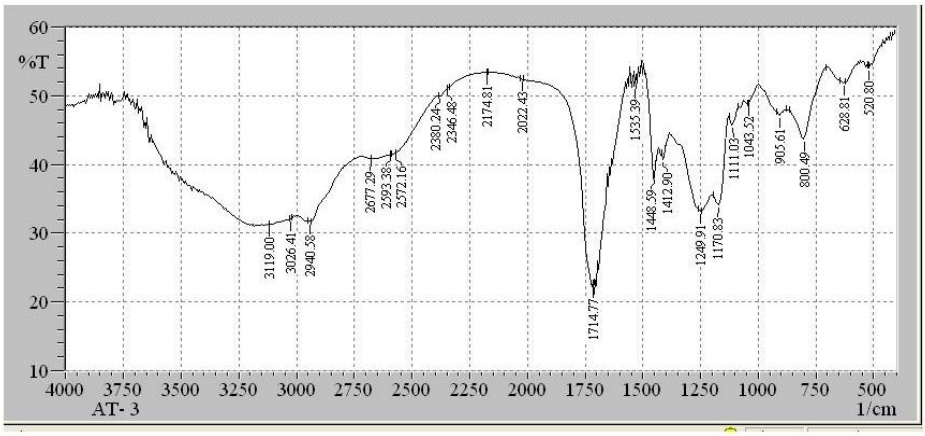

Fig. 3: FTIR analysis of Carbopol

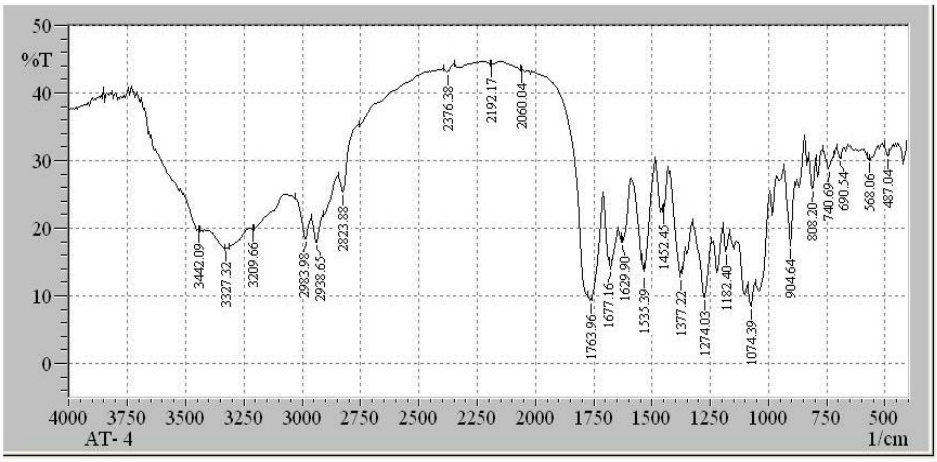

Fig. 4: FTIR analysis of Cefpodoxime Proxetil with HPMC K 200M

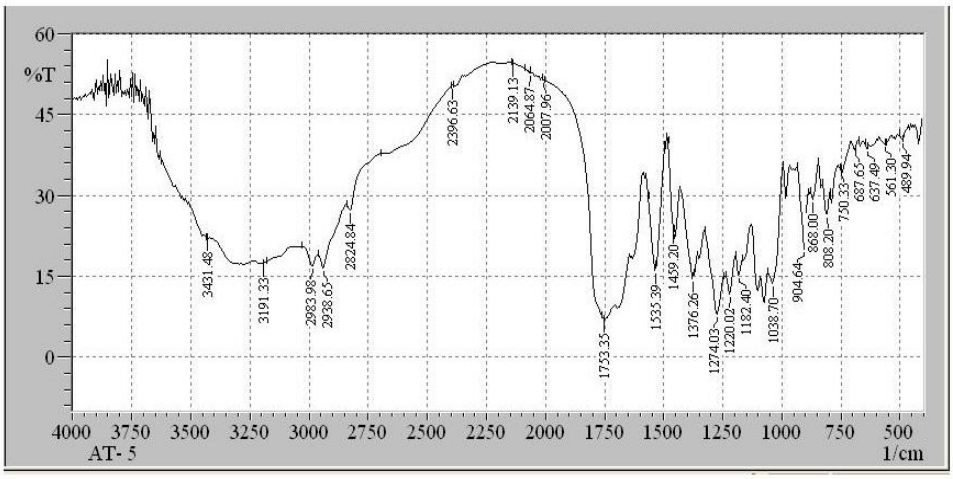

Fig. 5: FTIR spectrum of Cefpodoxime Proxetil with Carbopol

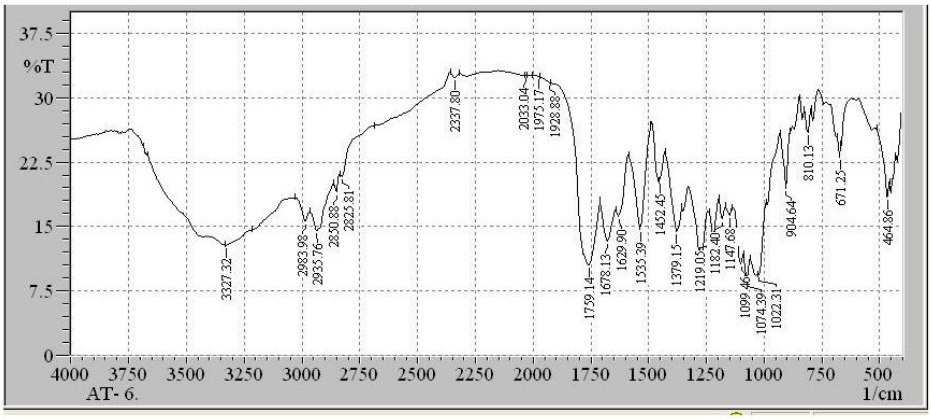

Fig. 6: FTIR spectrum of blend (Cefpodoxime Proxetil+HPMC K 200M + Cabopol+Exicipient in mixture)

Compatibility studies of pure drug Cefpodoxime Proxetil with polymers were carried out prior to the preparation of tablets. IR spectra of pure drug Cefpodoxime Proxetil and that of with polymers were obtained, which are shown in figure 2 to figure 6.All the characteristic peaks of Cefpodoxime Proxetil were present in spectra thus indicating compatibility between drug & excipients. It shows that there was no significant change in the chemical integrity of the drug.

DSC analysis ofCefpodoximeProxetil (Pure drug) & blend

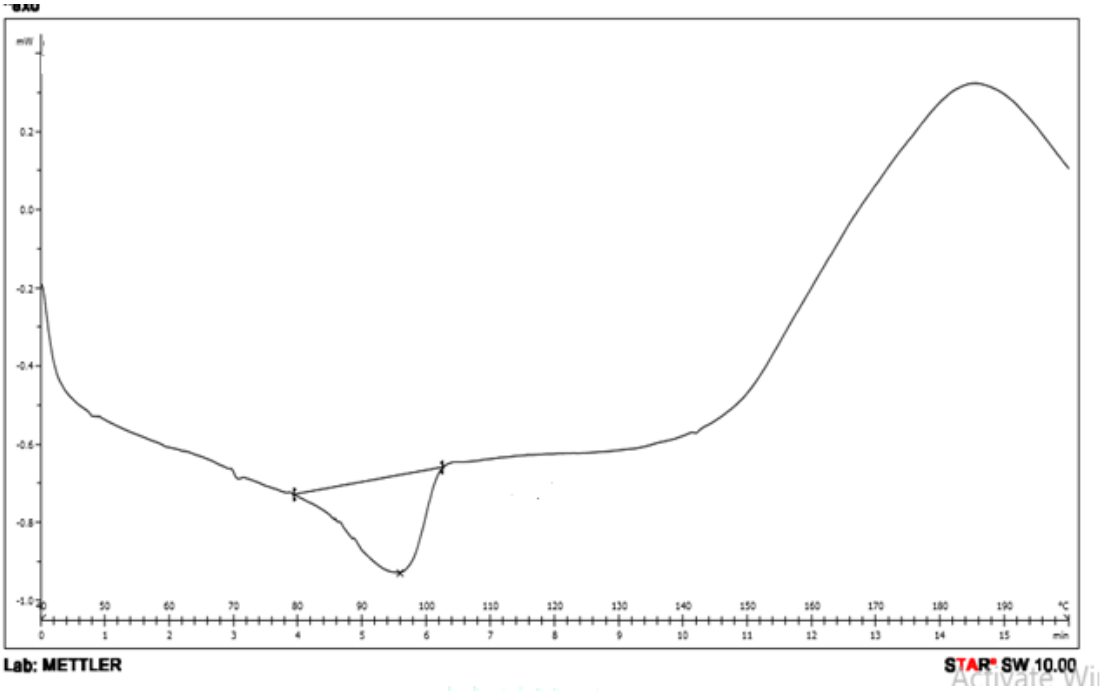

Fig. 7: DSC analysis of Cefpodoxime Proxetil (Pure drug)

The DSC thermogram of Cefpodoxime Proxetil Fig.8 exhibited a single sharp endothermic peak at 110^{0}C and, related to its melting point.

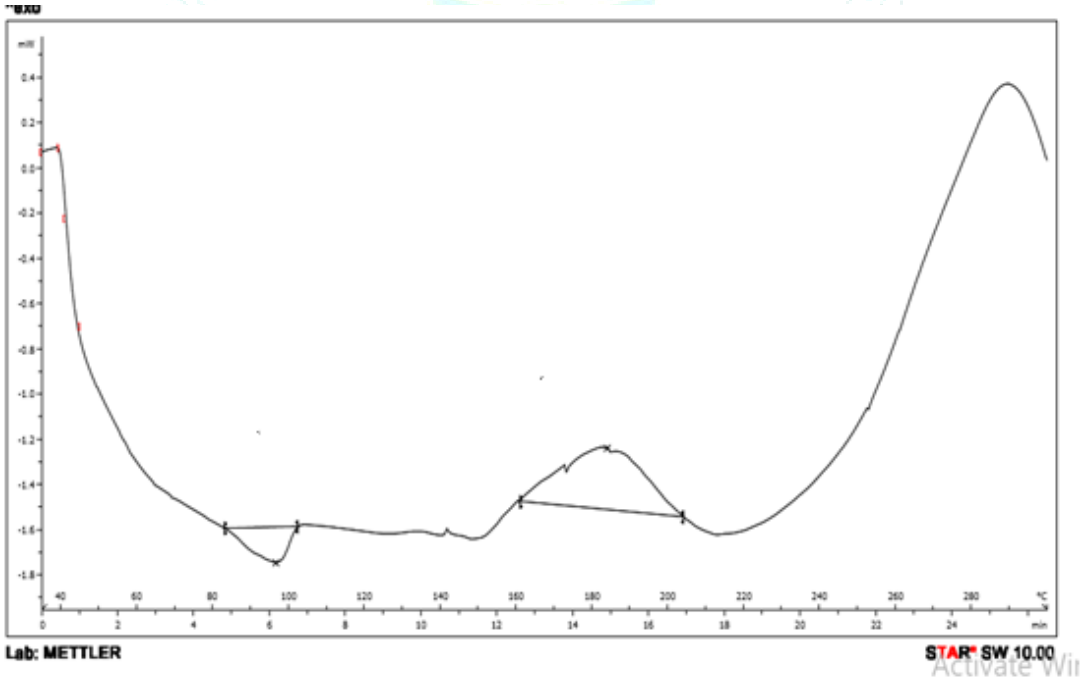

Fig.8: DSC analysis of blend (Cefpodoxime Proxetil+HPMC K 200M + Cabopol+Exicipient in mixture)

Studies were carried out using DSC 60, having TA60 software, shimadzu, and Japan. Accurately weight sample were placed on aluminum plate, sealed with aluminum lid and heated at a constant rate 5 ^{0}C/min over a temperature rang 0 to 250 ^{0}C. Cefpodoxime Proxetil shown in figure 8.

Evaluation of Fabricated Floating Mucoadhesive Tablets:

Table 4:Post-compression parameter of factorial designed batches

Formulation	Thickness (n=3) (mm)(SD)	Hardness (kg/cm²) (n=3)(SD)	Friability (%) (n=3)	Weight Variation (n=20)(mg) (SD)	Drug Content (%)
AT1	3.8±0.05	4.6±0.15	0.62±0.06	301.55 ± 0.58	99.55± 0.8
AT2	3.7± 0.47	4.5± 0.40	0.52±0.06	298.7 ± 6.2	96.18± 0.2
AT3	4.0 ± 04	4.2 ± 0.6	0.55±0.09	300.85 ± 5.2	97.53± 0.6
AT4	4.1 ± 0.2	4.6± 0.2	0.67±0.04	300.9± 6.2	98.35± 0.3
AT5	4.3± 0.1	4.7± 0.1	0.59±0.04	298.55 ± 5.3	99.89± 0.6
AT6	4.2± 0.1	4.4± 0.3	0.45±0.03	304.2 ± 1.3	97.11± 0.9
AT7	4.5±0.3	3.9 ± 0.11	0.52 ±0.04	303.85 ± 1.4	101.4± 0.5
AT8	3.8±0.26	4.3±0.28	0.46±0.02	301.8 ± 6.09	99.27± 0.6
AT9	4.7 ± 0.1	3.9 ± 0.2	0.58±0.05	302.15 ± 5.7	96.06± 0.4

Shape and Appearance

All Formulations were prepared well and select randomly and picked from each batch examined under lens for shape and in presence of light for color. Tablets showed standard concave surfaces with circular shape. Tablets were white in color.

Uniformity of Thickness

Thickness of the tablets was measured using vernire calipers by picking three tablets randomly from all the batches. The thickness of all the factorial designed batches tablets was found within the range of 3.7± 0.47 to 4.7 ± 0.1mm.

The results of thickness for tablets are shown in Table 4.

Weight Variation Test

The weight variation of the all formulations is shown in Table 4. All the tablets passed the weight variation test, i.e., average percentage weight variation was found within the pharmacopoeia limits of ±10%.

Hardness Test

Hardness of the tablets found within the range of 3.9 ± 0.11Kg/cm2 to 4.7± 0.1for batch AT1 to AT9 .

Friability Test

Friability values of Tablet for optimized batch AT1, AT2, AT3, AT4, AT5, AT6, AT7, AT8, AT9 were found 0.62±0.06, 0.52±0.06 %, 0.55±0.09%, 0.67±0.04%, 0.59±0.04%, 0.45±0.03%, 0.52 ±0.04%, 0.46±0.02% and 0.58±0.05% respectively. The obtained results were found to be well within the approved range (<1%) in all the designed formulations. That indicated tablets possess good mechanical strength. The results are tabulated in Table 4.

Drug Content

The drug content uniformity was examined as per I.P specification. All the batches of tablets were found to comply with uniformity of content test and results are mentioned in Table 4.

Table 5:*In-vitro* buoyancy study of optimized batches

Formulation Codes	Floating lag time(Sec)	Total FLT(Hrs)
AT1	23±2	>9
AT2	19±1	>10
AT3	33±4	>11
AT4	29±2	>12
AT5	21±2	>12
AT6	26±3	>12
AT7	41±2	>12
AT8	36±4	>12
AT9	42±4	>12

All tablets of each batch floated well and floating lag time observed in between 19±1and 42±4 Sec. Total floating time for all batches observes minimum more than 9 hrs.

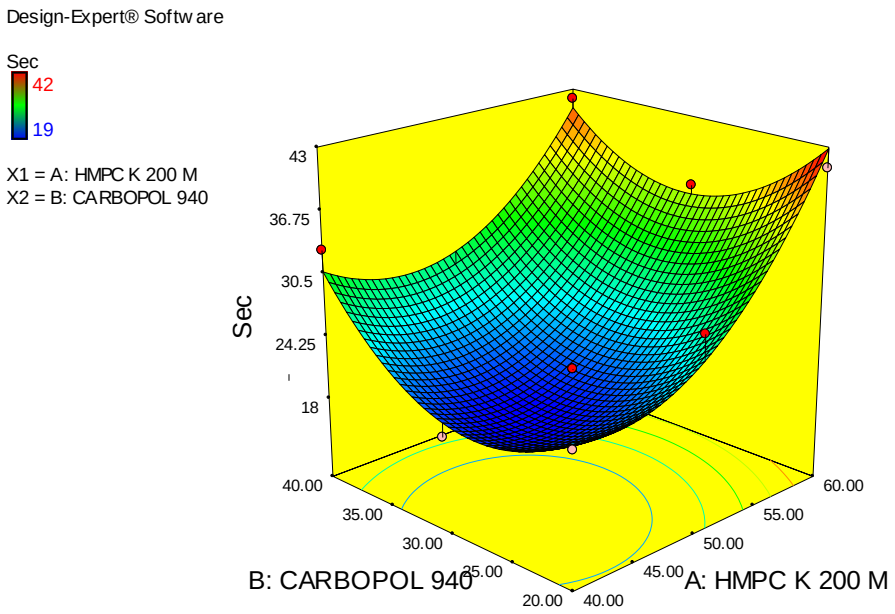

Fig. 9: A response surface plot showing effect of concentration of independent variables on the floating lag time

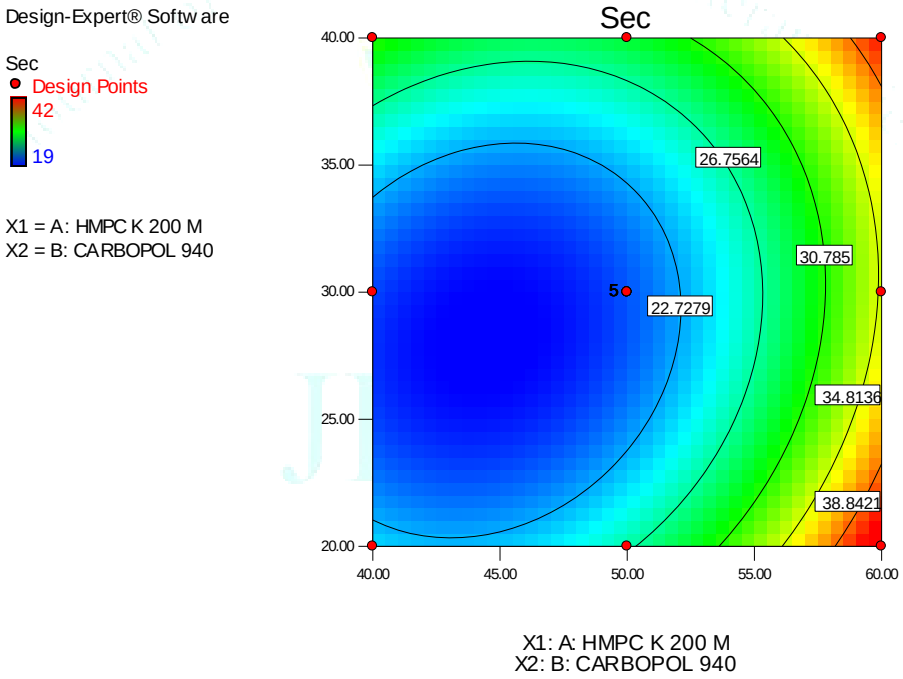

Fig. 10: A counter plot showing effect of concentration of independent variables on the floating lag time

Mathematical relationship in the form of polynomial equation for the measured response floating lag time was obtained and given in equation below .

Floating lag time(**Sec) =**

$$+20.90 \quad \text{..... (3)}$$
$$+7.33 * A$$
$$+1.33 * B$$
$$-2.25 * A * B$$
$$+6.86 * A^2$$
$$+6.86 * B^2$$

Table 6: Wash off Test – (Optimized Batches) Detachment time

Formulation code	Sr. No. of tablet	Detachment time (min)	Average
AT1	1	218	212
	2	207	
AT 2	1	234	237
	2	241	
AT 3	1	261	257
	2	254	
AT 4	1	270	278
	2	287	
AT 5	1	296	305
	2	304	
AT 6	1	319	337
	2	355	
AT 7	1	378	370
	2	363	
AT 8	1	396	401
	2	407	
AT 9	1	428	423
	2	419	

Table 7:*Ex-vivo* Mucoadhesion measurement, Swelling Index of optimized batches

Formulation batch code	Mucoadhesion strength (gm.)	Force of Adhesion (dyne/cm²)	Swelling index (%)
AT1	7.84	0.78	123.17
AT2	8.91	0.89	130.44
AT3	11.96	1.19	136,2
AT4	13.70	1.37	142.81
AT5	16.60	1.66	154.40
AT6	17.65	1.76	158.17
AT7	18.58	1.85	160.18
AT8	20.06	2.06	181.12
AT9	22.03	2.2	184.22

Ex-*Vivo* Mucoadhesion Measurement

All the batches show good Detachment time & mucoadhesive strength.

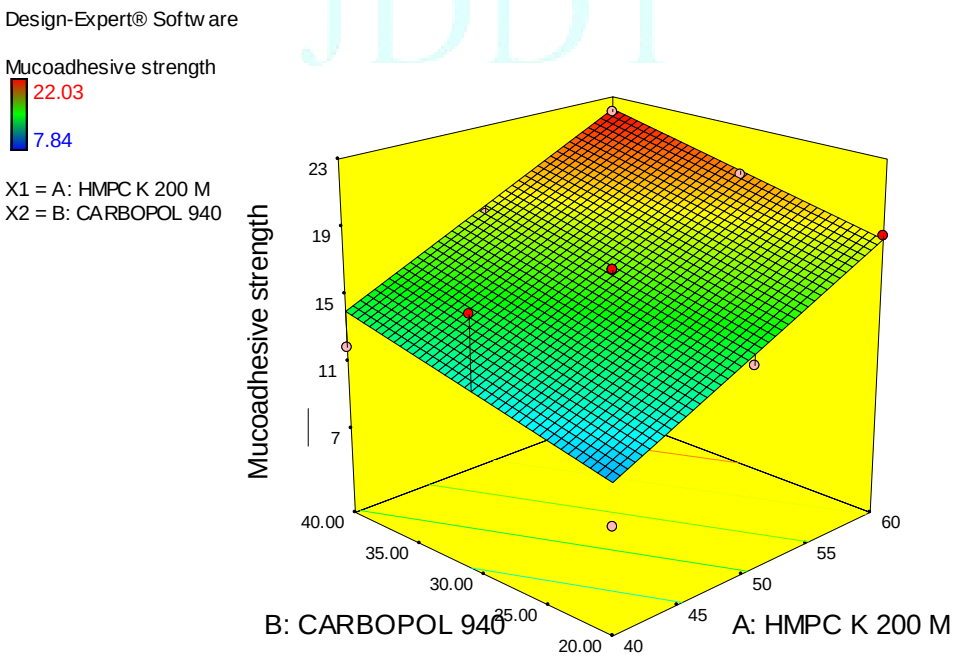

Fig. 11: A response surface plot showing effect of concentration of independent variables on the Mucoadhesive strength

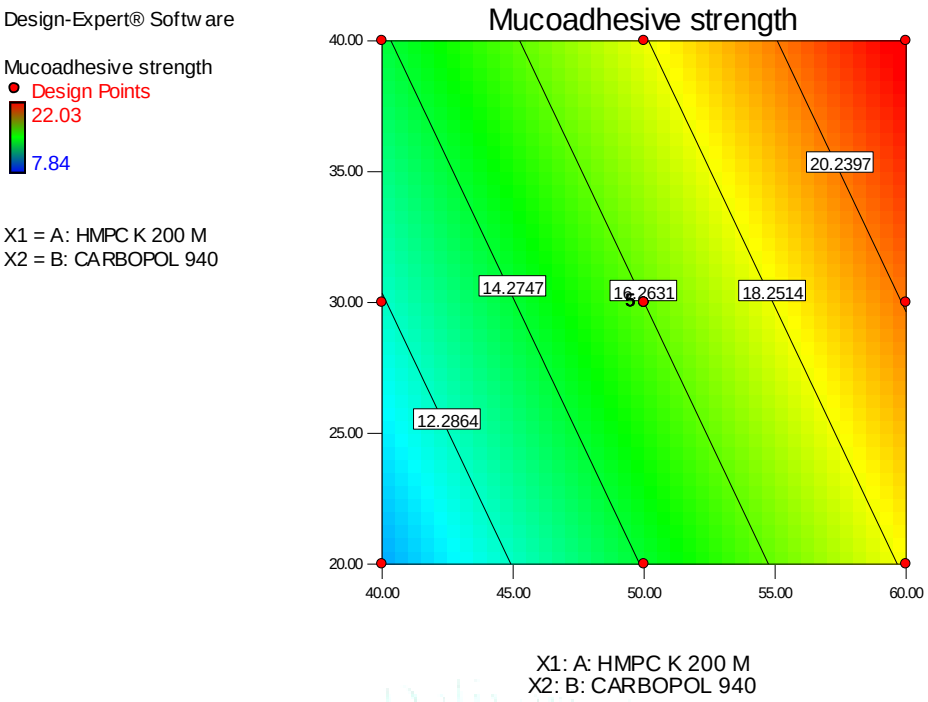

Fig. 12: A counter plot showings effect of concentration of independent variables on the Mucoadhesive strength

Mathematical relationship in the form of polynomial equation for the measured Mucoadhesive strength was obtained and given in equation below.

Mucoadhesive strength =+16.2+4.04 * A+1.9 * B ..... (4)

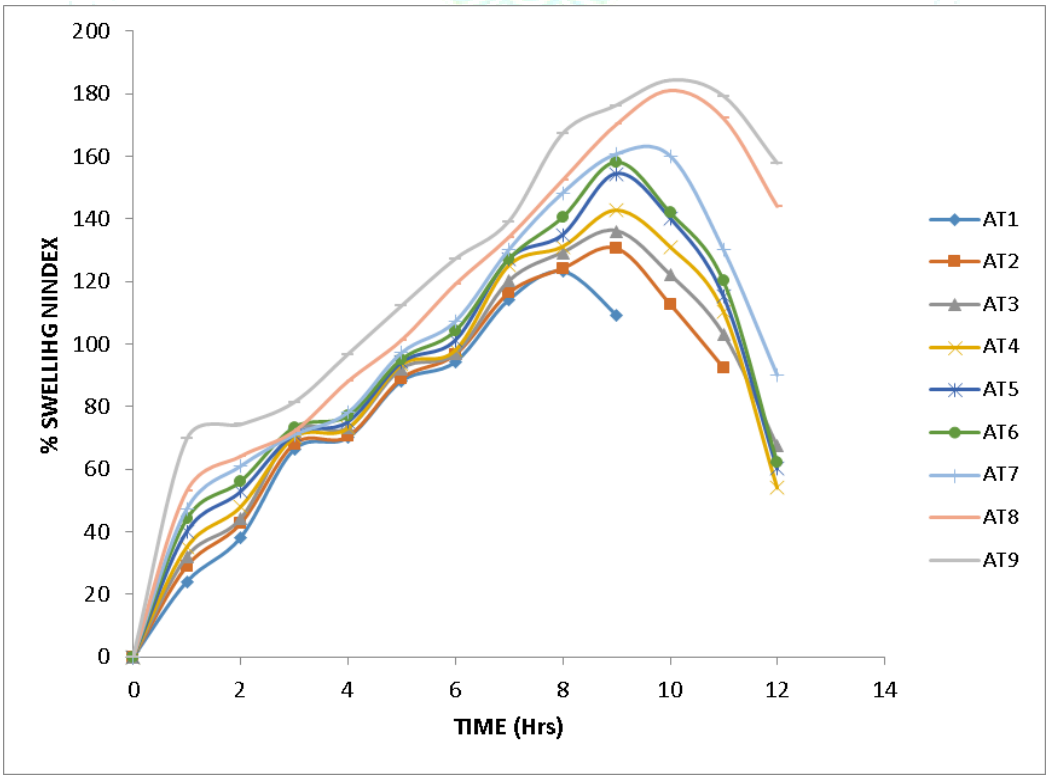

Fig. 13: % Swelling Index of Optimized batches in graphical presentation

Swelling index of all batches shown figure 13 i.e. AT1 to AT9 is 123.17%, 130.44%, 136.2%, 142.81%, 154.40%, 158.17%, 160.18%, 181.12% and 184.22% respectively

The swelling ability of the tablets could be attributed to the existence of hydrophilic moieties on both HPMC K 200M.

From the plots it as from the Figure 2 and 3, it was concluded that the SI increases with increasing polymer concentrations. Previously it was reported that matrix containing Lactose exhibited higher water uptake than those containing the other excipients Bamiro *et al*. [26]

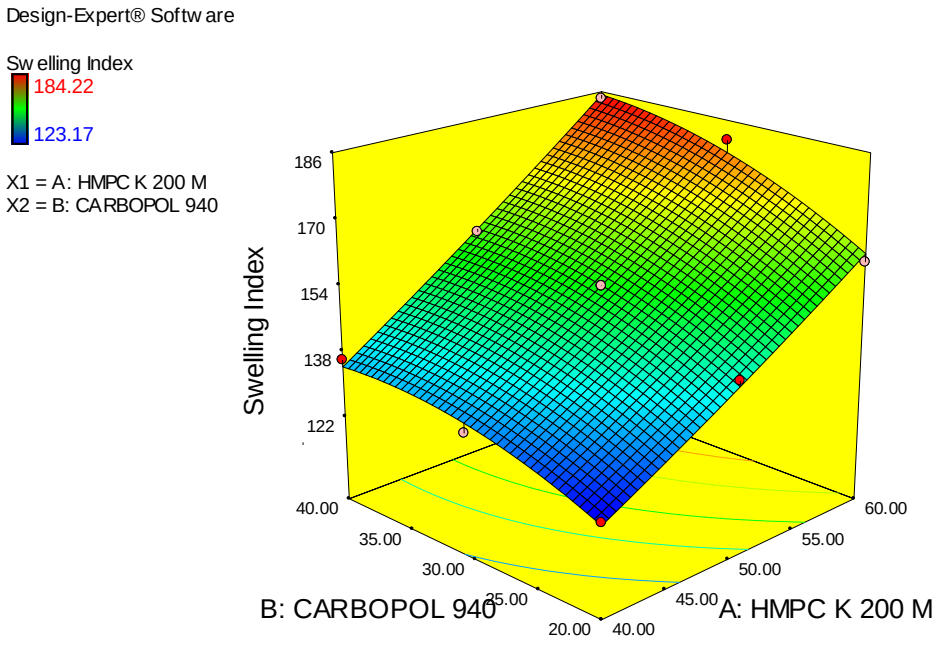

Fig. 14: A response surface plot showing effect of concentration of independent variables on the swelling Index

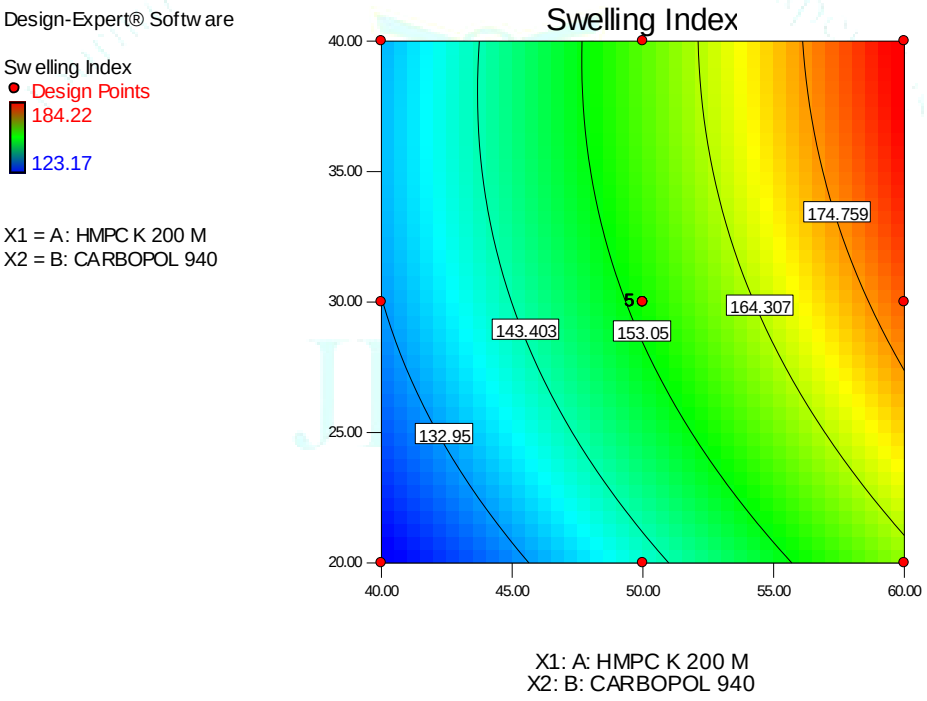

Figure 23: Fig. 15: A counter plot showing effect of concentration of independent variables on the swelling Index

Mathematical relationship in the form of polynomial equation for the measured Swelling Index was obtained and given in equation below.

Swelling Index =+154.53 ..... (5)

+22.6* A
+8.7* B
+2.75* A * B
+0.93* A^2
-4.36* B^2

Result of ANOVA

Table 8: Result of ANOVA

Response model	Sum of square	Degree of freedom	Mean square	F value	P value	R square	Ade. Precision
Floating Lag time	802.31	5	158.83	37.94	<0.0001	0.9644	16.35
Mucoadhesive strength(gm)	151.68	2	65.29	19.16	0.0004	0.8931	14.017
Swelling Index (%))	3638.33	5	726.15	193.1	<0.0001	0.9928	47.737

In-Vitro Drug Release Study of Optimized Batches

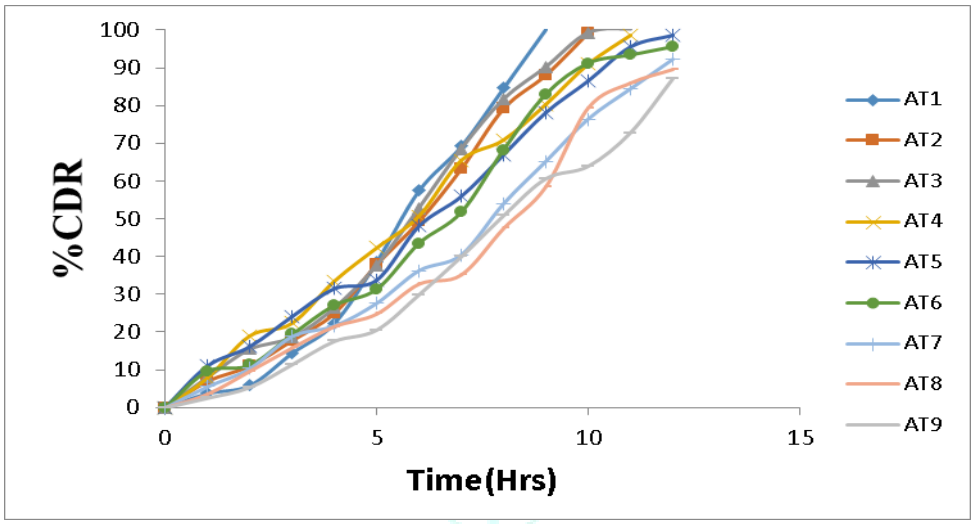

Fig. 16: % Drug release of Optimized batches AT1-AT9

The In-vitro drug release studies of factorial batches were carried out using USP Type II dissolution assembly. The drug release batch AT1, AT2, AT3, AT4, AT5, AT6, AT7, AT8 and AT9 were found 100.22%, 99.23%, 100.17%, 98.59%, 98.65%, 95.49%, 92.16%, 89.53%, and 87.07% respectively.

Data Analysis

***In vitro* Drug release data Analysis**

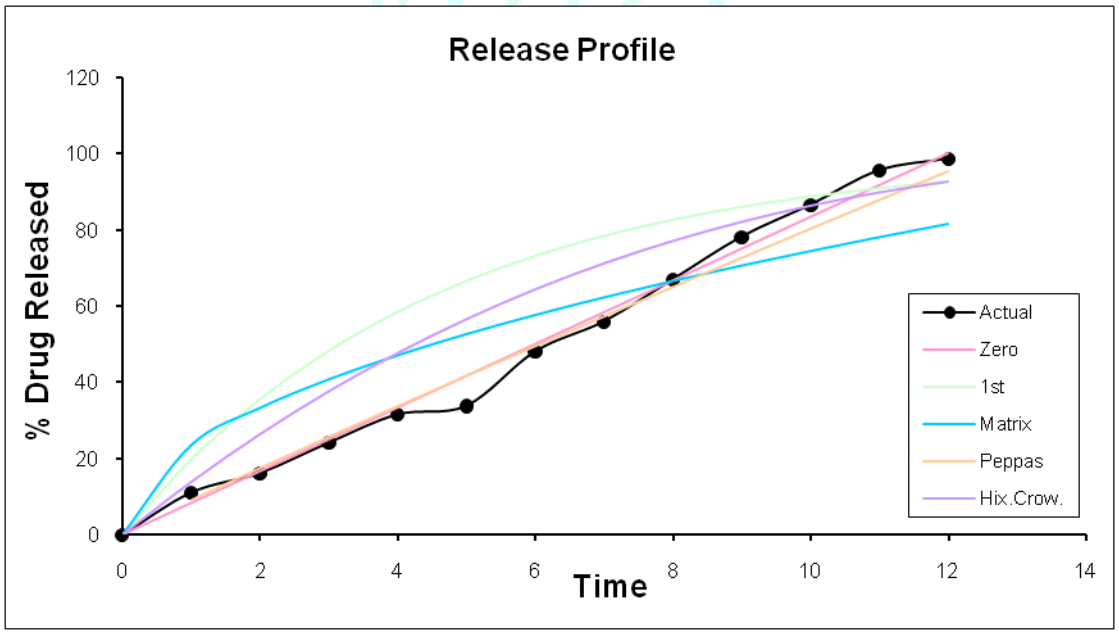

Fig. 17: Release Profile of optimized batch (AT5)

Kinetic analysis of dissolution data optimized batch (AT5)

Zero orderEquation:

Fig. 18: Zero order equation for optimized batch (AT5)

Korsmeyer-Peppas:

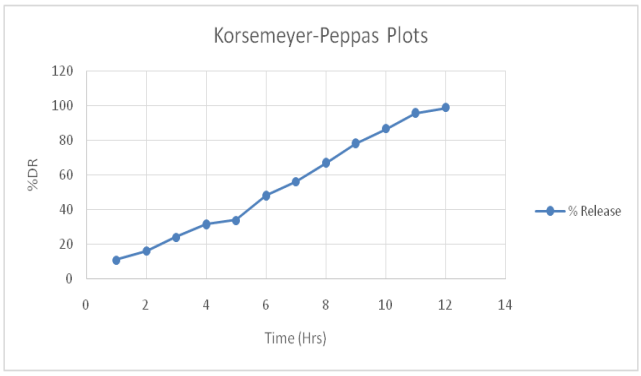

Fig. 19: Korsmeyer-Peppas equation for optimized batch (AT5)

Table 9: Mathematical Modeling and Release Kinetics of optimized batches

Batch	Zero order		First order		Higuchi		Hixson- Crowell		Korsmeyer-Peppas		
F5	r^2	$K_0(h^{-1})$	r^2	$K_1(h^{-1})$	r^2	$K_H (h^{-1/2})$	r^2	$K_{HC} (h^{-1/3})$	r^2	n	$K_{KP}(h^{-n})$
	0.9955	8.3588	0.8438	-0.2205	0.9116	23.5558	0.9295	-0.0486	0.9896	0.9449	9.1279

*r^2= Correlation coefficient; K = Kinetic constant; n= Diffusional exponent

When the regression coefficient 'r' value of Zero order and korsmeyer-peppas plots were compared, it was observed that the 'r' values of Zero order was found to be 0.9955 whereas the 'r' values of korsmeyer-peppas plot was found to be 0.9896 indicating drug release from optimized formulation was found to follow Korsmeyer-peppas kinetics.

The in-vitro dissolution data was fitted to Korsmeyer-equation, values of exponent 'n' was found to be 0.9449 indicating that the drug release is by Anomalous transport mechanism.

CONCLUSIONS:

Floating-Mucoadhesive tablets of Cefpodoxime Proxetil were prepared by direct compression method using various polymers such as HPMC K 200 M, Carbopol 940P. Sodium Bicarbonate & Citric acid was incorporated as a gas-generating agents .

The prepared tablets exhibited satisfactory physico-chemical characteristics. All prepared batches shown good in-vitro buoyancy studies and Mucoadhesion studies. The best result from optimized batches is of AT5 which gives floating lag time 21±2, Mucoadhesive strength 16.60 gm & drug release 98.65% in 12hrs. Optimized formulation AT5 showed Zero order as best fit model having R^2 value is 0.9955.. Floating-Mucoadhesive tablet were prepared and could be a promising approach to deliver Cefpodoxime Proxetil with improved gastric residence time which improve bioavaibility & effective in the management of the bacterial infection.

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