Research Article

Preparation and Evaluation of Dispersible Tablets of A Model Antibiotic Drug

Kalavathy D.J.[1*], Panduranga K.R.[2], Prakash Rao B.[3]
[1*] Visveswarapura Institute of Pharmaceutical Sciences, Bangalore, India.
[2] Kemwell Biopharma Pvt. Ltd., Bangalore, India.
[3] Karnataka College of Pharmacy, Bangalore, India.
*Corresponding author's E-mail: dj.kalavathy@yahoo.com

Accepted on: 21-06-2012; **Finalized on:** 31-12-2012.

ABSTRACT

Dispersible tablets or kid tablets are now a day increasingly used for formulating drugs for infants and children with better bioavailability. The study was intended to develop and characterize different types of formulations of water dispersible tablets using direct compression and wet granulation techniques and to arrive at a standard formulation, which ultimately meets all criteria required for tablets during shelf life. DSC and TGA studies carried out to see possible drug excipients interaction. It is concluded that a water dispersible tablet was successfully formulated using super disintegrants, which gave a disintegration time of 15 seconds and a hardness of 2.5Kg/cm^2 and without any additional modification in manufacturing The DSC and TGA results gave that there is no interaction; only the water loss is taking place.

Keywords: Antibiotic, Super disintegrants, Dissolution, Dispersible tablets.

INTRODUCTION

The dispersible tablets have gained popularity and acceptance due to several advantages like fast disintegration, quick dissolving, rapid release and improved patient compliance. This dosage form combines the advantages of dry and liquid formulation. The preparation of formulations suitable for manufacturing dispersible tablets requires both study of the physicochemical incompatibilities of the active ingredient and a search for the right excipients making it possible to comply with the requirements of the various pharmacopoeias.

Cefixime is a third generation antibiotic used in treatment of lower respiratory infections like bronchitis, urinary tract infections, pharyngitis, and gonorrhea in children and elderly patients. It is bactericidal in action. Cefixime is better absorbed from oral suspension than from tablets. Therefore formulating Cefixime as a water dispersible tablet which forms a suspension in water before administration increases its efficiency.

Only 40-50% of an oral dose of Cefixime is absorbed from the gastrointestinal tract. Cefixime is better absorbed from oral suspension than from tablets, therefore a dispersible tablet dissolved in water before administration gives better absorption.

MATERIALS AND METHODS[12-14]

Microcrystalline cellulose powder (plain), microcrystalline cellulose powder (granular VC-202 and VC-302), sodium starch glycolate, Cross povidone, PVP K-30, starch, Aerosil, citric acid monohydrate, sodium saccharin, talc were obtained as gift sample from Karnataka Antibiotics and Pharmaceuticals Ltd., Bangalore, India.

Formulation of dispersible tablets

The tablets were prepared by wet granulation and direct compression method using the formula as given in the table 1 and 2 respectively. The drug and excipients were passed through a #60 size mesh prior to the preparation of the dosage form. The entire ingredients were weighed separately and mixed thoroughly for 10 minutes to ensure uniform mixing in geometrical ratio.

Wet granulation method

The wet granulation method was carried out using two binding agents' viz. PVP K-30 and starch. PVP K-30 in isopropyl alcohol in different concentrations such as 1%, 2%, 3%, and 4%. The other binding agent starch was used in different concentrations.

Dry granulation method

In dry granulation method all the ingredients were passed through # 60 mesh separately. The drug and the diluents were mixed in small portion of both each time and blending it to get a uniform mixture and kept aside. The other ingredients were weighed and mixed in geometrical order

Pre-compression parameters

The pre-compression parameters like Angle of repose, Compressibility Index (Carr's Index) and Hausner's ratio were calculated as follows.

Angle of repose:

$$\Phi = \text{Tan}^{-1}h/r$$

Where Φ is angle of repose, h is the height of the pile and r is the radius of the pile.

Compressibility Index (Carrs Index) is given by:

$I = (1 - V_t/V_b) \times 100$

Where Vt-tapped volume, V_b-Bulk volume

Hausner's ratio is given by: $H = D_t / D_0$.

Evaluation of the Compressed Tablet[15]

Post compression parameters

All the formulations of Cefixime prepared were evaluated for following physical and chemical parameters.

Size and Shape: The tablets formulated were circular in shape with 12 mm diameter

Organoleptic property: Colour—the tablets were found to be uniformly light yellow in colour.

Taste — All tablets prepared was tested for taste and odour. It was found that all the formulations gave sweet taste and pleasant odour

Weight variation: Twenty dispersible tablets were selected randomly from the lot and weighed individually to check for weight variation. IP limit for weight variation in case of tablets weighing 130 – 324 mg ± 7.5 % and more than 324 mg ± 5%.

Hardness: The hardness of the dispersible tablet was determined using a Monsanto hardness tester. It is expressed in Kg / cm^2

Thickness: The thickness of the tablets was measured using digital vernier caliper scale. It is expressed in millimeter and was found to be within ± 0.2mm

Friability: All dispersible tablets were tested for friability, using Roche friabilator.

20 tablets were weighed initially and transferred to the friabilator.

The instrument was set at 25rpm for 4min. The resulting tablets were weighed and the % loss was calculated using formula

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

Uniformity of dispersion: All the formulations prepared were tested for uniformity of dispersion. Two tablets were placed in water and stirred gently until a smooth dispersion is obtained, which was passed through a sieve screen with a nominal mesh of 710µm. All the formulations prepared have complied with uniformity of dispersion.

Disintegration time: The disintegration time for dispersible tablet was determined in accordance with USP disintegration apparatus. The water was maintained at a temperature of 37 ± 0.5^0 C and time taken for all the tablets to disintegrate completely was noted

Wetting time: A method was used to measure wetting time and capillarity of the dispersible tablets. The tablet was placed in a petridish of 5.5 cm in diameter, containing 10 ml of water at room temperature, and the time for complete wetting was recorded. The measurements were carried out six times

HPLC Assay: The liquid chromatography system consisted of UV-binary system (make-Shimadzu, Japan, model-VP series), a SCL-10 A VP system controller, a LC-10AT VP pump, a SIL-10AD VP injector and a SPD-10A VP UV detector. Analysis were performed on reversed- phase symmetry system C_{18} 5 µm 110A 250X4.60mm, ODS (octa decyl silicate column). Composition of mobile phase is tetra butyl ammonium hydroxide solution and acetonitrile (3:1) phosphate, pH adjusted to 6.5 with orthophosphoric acid. Flow rate is (binary) 1 ml/min, column temperature 40^0C; UV detector wavelength 254 nm.

Dissolution studies: *In vitro* dissolution profile was performed on all the formulations F_1 –F_{22} in pH 0.05M potassium phosphate buffer as dissolution medium it was selected as dissolution media for in vitro release studies based on literature regarding the solubility of Cefixime and same was reported in USP

Drug-Excipients interaction studies

IR spectroscopy, DSC and TGA methods were used to study the drug excipients interaction in the formulations.

IR Studies

IR is one of the most powerful analytical technique which offers possibility of chemical identification. The IR spectrum of Cefixime, Cefixime-excipients and formulations were obtained using KBr pellet method using Fourier Transform IR Spectrophotometer

DSC Studies: *(Differential Scanning Calorimetry)*

The Thermal behavior of Cefixime and excipients using DSC was studied to confirm any drug excipients interaction in the formulations. Here Mettler Toledo, DSC 821 was used. About 5mg of the sample was weighed accurately and crimped nonhermatically between two aluminum discs. This sample was placed in the test chamber on the pan and closed and operated under the following conditions.

Atmosphere: Nitrogen gas with flow rate of 100ml/min.

Test conditions: 30° - 300°C with heating rate of 10°C/min rise

TGA studies*: (Thermo gravimetric analysis)*

Thermo gravimetric analysis (TGA) measures the thermally induced weight loss of a sample as a function of temperature, when combined with DSC results; TGA provides an excellent approach to the determination of thermal properties of the pharmaceutical material. The TGA studies were also done to study the thermal nature of the drug and obtain more information regarding the stability of the drug in the formulations. Here TA Instruments, Q 500 was used for the studies. About 10-20mg of the sample was accurately weighed and placed in

the furnace for heating. The sample was subjected to the following conditions.

Stability studies

Stability studies were carried out at 25°C/60%RH and 40°C/75%RH for the optimized formulation for 3 months.

Method**:** The selected formulations were packed in amber-colored bottles, which were tightly plugged with cotton and capped. They were then stored at 25°C/60%RH and 40°C/75%RH for 3 months and evaluated for their physical appearance, drug content, disintegration time and drug excipients compatibility at 1 month intervals of time.

Table 1: Formulation of Cefixime dispersible tablets by wet granulation method

Ingredients	F1	F2	F3	F4	F5	F6	F7	F8	F9
	Unit formula (mg/tablet)								
Cefixime trihydrate	112	112	112	112	112	112	112	112	112
MCCP (plain)	151.1	178.1	170.3	172. 2	153.9	165.1	169.0	174.8	173.3
PVP K 30	14.0	10.5	7.0	3.5	3.5	-	-	-	-
Sodium Starch Glycolate	17.5	13.0	14.0	17.5	21.0	21.0	17.5	15.8	15.8
Aerosil	5.3	4.9	3.5	3.8	3.5	5.3	3.5	4.2	4.2
Starch	-	-	-	-	17. 5	14.0	12.2	8.8	9.8
Citric acid Mono hydrate	1.8	1.8	2.1	2.1	3.5	2.1	3.5	3.5	3.8
Sodium Saccharin	2.1	3.5	5.3	4.9	4.6	3.5	3.5	3.8	3.8
Talc	10.5	7.0	8.8	7.0	10.5	7.0	5.3	3.6	3.5
Magnesium stearate	-	-	1.8	1.8	1.8	1.8	1.8	1.8	2.1
Flavour	35.0	17.5	24.5	24.5	17.5	17.5	21.0	21.0	21.0
Methyl paraben	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Propyl Paraben	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Total Weight	**350.0**	**350.0**	**350.0**	**350.0**	**350.0**	**350.0**	**350.0**	**350.0**	**350.0**

Table 2: Formulations of Cefixime dispersible tablets by direct compression method.

Ingredient	F10	F11	F12	F13	F14	F15	F16
	Unit formula (mg/tablet)						
Cefixime trihydrate	112	112	112	112	112	112	112
MCC-202 (granular)	125.23	114.13	111.73	-	-	-	-
MCC-VC 302 (granular)	-	-	-	121.03	112.03	109.03	110.23
Sodium Starch Glycolate	15	24.0	30.0	-	-	-	-
Cross povidone	-	-	15.0	24.0	30.0	33.0	36.0
Starch	15	12.0	9.0	9.0	10.5	10.5	9.9
Aerosil	3.0	4.5	3.0	4.5	4.5	4.5	5.1
Sodium Saccharin	4.5	3.9	6.0	3.0	4.5	4.5	3.0
Citric acid	1.8	3.0	6.0	3.0	3.0	4.5	3.0
Talc	3.0	3.0	3.0	3.0	4.5	3.0	3.0
Magnesium stearate	1.8	1.8	1.8	1.8	1.8	1.8	2.1
Flavour	18.0	21.0	18.0	18.0	16.5	16.5	15.0
Methyl paraben	0.60	0.60	0.60	0.60	0.60	0.60	0.60
Propyl Paraben	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Total Weight	**300**	**300**	**300**	**300**	**300**	**300**	**300**

RESULTS AND DISCUSSION

In this work an attempt was made to formulate and evaluate rapidly dispersible tablets intended to be dispersed in water before administration containing cefixime as a model drug.

Different concentrations of diluents, disintegrants, binders, and sweetening agents were used to prepare the tablets using wet granulation and direct compression technique. A total of 16 formulations were prepared. F1-F9 was prepared using wet granulation method and F11 to F16 was prepared using direct compression technique.

The formulation which gave best disintegration time, dissolution and hardness were selected.

Pre compression parameters

Angle of repose for all formulations were found to be less than 30^0 which indicate free flowing granules except F1 and F2 which exhibited sticking and Carr's index was found to be less than 25% indicating good flowability. The Hausner's ratio was found to be less than 1.34 indicating good flowability. The angle of repose, Carr's index and Hausner's ratio of the selected formulation F16 was found to be 21.21^0, 11.2% and 1.123 respectively. This indicates good flow property of the granules. Granule parameters of Cefixime formulations are given in table 3.

Table 3: Granule parameters of Cefixime formulation

F. Code	Bulk volume Untapped in ml (V_o)	Bulk volume (Vt) Tapped in ml	Bulk density untapped (M/V_o)	Bulk density Tapped (M/V_t)	Bulkiness Untapped (V_o/M)	Bulkiness tapped (V_t/M)	Angle of repose $\theta=\tan^{-1}h/r$	% Compressibility $100(V_o-V_t)/V_o$	Hausners ratio V_o/V_t
F_1	19	15	0.448	0.567	2.231	1.762	29.31	21.1	1.265
F_2	20	16	0.403	0.504	2.478	1.982	23.30	20.0	1.250
F_3	21	17	0.402	0.497	2.484	2.011	25.16	19.1	1.236
F_4	20	16	0.415	0.519	2.404	1.923	28.13	20.0	1.250
F_5	19	15	0.448	0.567	2.231	1.762	29.31	21.1	1.264
F_6	28	24	0.439	0.513	2.274	1.949	28.23	14.3	1.168
F_7	26	22	0.469	0.554	2.13	1.803	23.21	15.4	1.182
F_8	26	23	0.469	0.530	2.130	1.885	29.18	11.6	1.130
F_9	27	24	0.448	0.504	2.23	1.982	25.23	11.2	1.125
F_{10}	20	16	0.415	0.519	2.404	1.923	28.13	20.0	1.237
F_{11}	21	17	0.395	0.489	2.526	2.044	25.21	19.1	1.237
F_{12}	18	15	0.452	0.542	2.212	1.843	26.80	16.7	1.199
F_{13}	28	25	0.436	0.488	2.219	2.045	26.11	10.8	1.119
F_{14}	26	23	0.469	0.530	2.130	1.885	29.18	11.6	1.130
F_{15}	28	25	0.436	0.488	2.219	2.045	26.11	10.8	1.119
F_{16}	27	24	0.452	0.508	2.21	1.965	21.21	11.2	1.123

Table 4: Hardness, Friability and thickness of the tablets F1 to F9

Formulation code	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9
Hardness in Kg/cm^2 *	4.0	3.5	3.0	2.5	3.5	3.5	3.5	3.0	2.5
Friability in %	0.51	0.56	0.61	0.63	0.60	0.59	0.84	0.83	0.63
Thickness in mm *	4.03	4.10	4.00	4.01	4.08	4.01	4.01	4.03	4.01

* Average of 6 determinations

Table 5: Hardness, Friability and thickness of the tablets F10 to F22

Formulation code	F_{10}	F_{11}	F_{12}	F_{13}	F_{14}	F_{15}	F_{16}
Hardness in Kg/cm^2 *	3.5	3.5	3.5	3.5	2.5	2.5	2.5
Friability in %	0.63	0.64	0.61	0.60	0.86	0.73	0.76
Thickness in mm *	3.21	3.24	3.16	3.20	3.18	3.21	3.21

* Average of 6 determinations

Table 6: Disintegration time of Cefixime Formulations F1-F9

Formulation code	F_1	F_2	F_3	F_4	F_5	F_6	F_7	F_8	F_9
Time in seconds *	60	55	40	35	60	40	35	28	25

* Average of 6 determinations

Table 7: Disintegration time of Cefixime Formulations F10 – F16

Formulation code	F_{10}	F_{11}	F_{12}	F_{13}	F_{14}	F_{15}	F_{16}
Time in seconds *	40	25	20	25	20	20	15

* Average of 6 determinations

Table 8: Assay content of Cefixime Formulations from F1-F16

Formulation code	Drug content ± SD *
F_1	101.26%±0.41
F_2	103.63%±0.29
F_3	99.71%±1.63
F_4	97.42±0.52
F_5	95.81±0.28
F_6	98.64±0.71
F_7	100.12±0.55
F_8	95.91±0.49
F_9	99.72±0.28
F_{10}	99.84±0.55
F_{11}	98.31±0.31
F_{12}	95.11±0.52
F_{13}	98.36±0.48
F_{14}	97.48±0.72
F_{15}	99.01±0.56
F_{16}	100.64±0.31

* Average of 2 determinations.

Post compression parameters:

Weight variation: The average tablet weight of different formulations were checked and found to be within limits

Hardness: The hardness of the formulations is given in the Table 4 and 5.

Uniformity of dispersion: All the formulations prepared have complied with uniformity of dispersion.

Disintegration time: All the formulations showed a disintegration time of less than 60 seconds which is well within the USP 2006 limit (USP limit is 180 seconds). The selected formulation F9 prepared by wet granulation gave a disintegration time of 25 seconds and F16 prepared by direct compression gave a disintegration time of 15 seconds as shown in Table 6 and 7.

Drug content estimation: The different formulations were subjected to drug content uniformity study, Drug content was estimated in all the formulations using HPLC method. The data of drug content is given in Table 8**.** The Cefixime content in all formulations were in the limit of 95.11% to 103.63% with low standard deviation of less than 1%. The result shows that drug was uniformly dispersed, distributed throughout the formulations. The selected formulations F9 and F16 gave 99.72 and 98.36% respectively which were within the limit.

***In vitro* dissolution**

It was found that all the formulations F1 –F16 gave more than 85% drug release at the first 5 minutes and more than 95% drug release at 15 minute at the end of 20 minutes it was found that the selected formulations F9 and F16 gave more than 99% drug release as shown in figure 1 & 2. These results showed that the formulation F9 gave satisfactory results.

In direct compression method MCCP (granular) was used as diluent because of its good compressibility. Two grades of MCCP (granular) i.e. MCC VC-302 and MCC VC-202 were used in a concentration of 35 - 42% and 37-42% respectively. It was found that MCC VC 302 gave better results and hence was used in all other formulations from F13 –F16. MCC VC 302 in concentration of 36.7% in F16 gave good results. Sodium starch glycolate and cross povidone were used as disintegrating agents. In formulation F10 - F12 sodium starch glycolate alone in a concentration of 5-10% was used but this gave high disintegration time. Therefore a combination of sodium starch glycolate and cross povidone in concentration of 10% and 5% respectively was tried which gave a disintegration time of 20 seconds. Later cross povidone alone in a concentration of 5% to 18% was used in formulations F14 – F16 and it was found that a concentration 12% in formulation F19 gave disintegration time of 15 seconds. The concentration of Aerosil was varied between 1-1.7% and a concentration of 1.7% in F16 gave good results of free flowability and disintegration time. In all the formulations F1-F16 sodium saccharin 0.5-1.5% was used as sweetening agent and citric acid 0.5-2.0% was used to enhance its taste when dispersed with water disintegration time of 35-60 seconds and hardness 3.0-4.0 kg/cm^2.

Based on their results F9 was selected from wet granulation method and F16 was selected from direct compression method.

The dissolution data of all formulations are shown in Table 9 and 10.

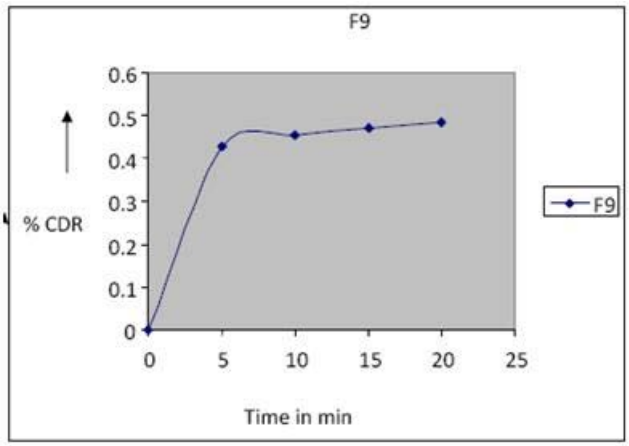

Figure 1: *In vitro* dissolution of selected formulation F9

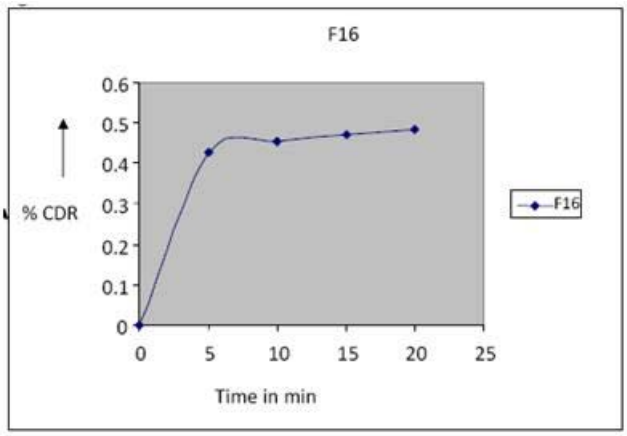

Figure 2: *In vitro* dissolution of selected formulation F16

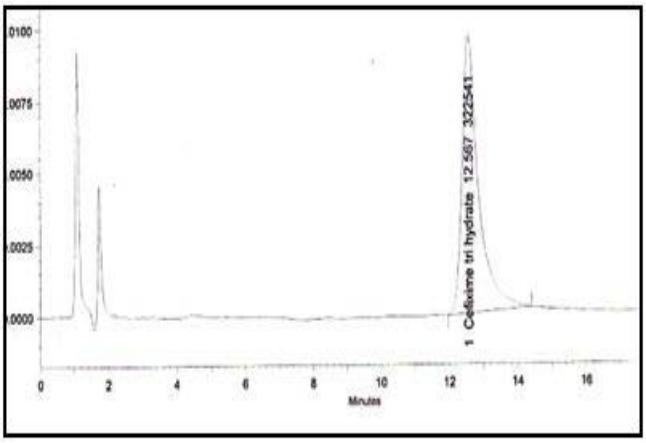

Figure 3: HPLC Spectrum of Cefixime trihydrate

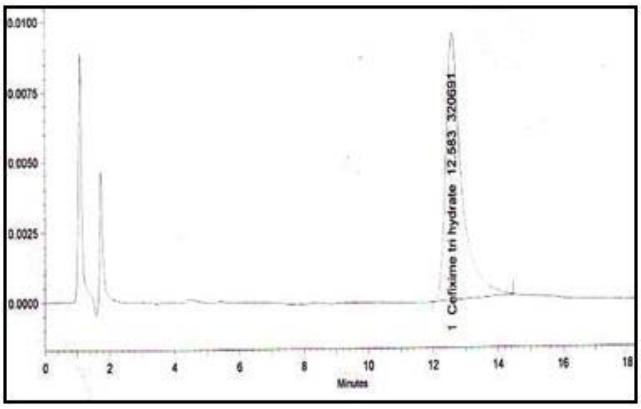

Figure 4: HPLC Spectrum of formulation IX

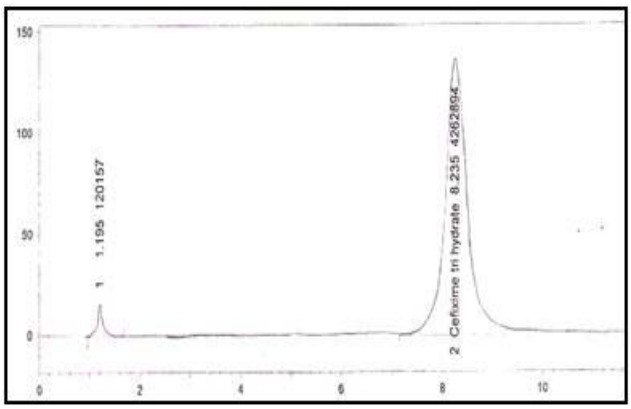

Figure 5: HPLC Spectrum of formulation XVI

Table 9: Dissolution studies of Cefixime formulation F9

Time (minute)	%CDR ± SD
5	86.41±0.30
10	92.34±0.35
15	96.02±0.41
20	99.17±0.25

Table 10: Dissolution studies of Cefixime formulation F16

Time (minute)	%CDR ± SD
5	86.54±0.38
10	91.68±0.45
15	95.73±0.40
20	99.65±0.36

Drug-Excipient compatibility study:

The IR absorption spectrum of pure Cefixime and the selected formulations were matching with each other and showed finger print region. This shows that Cefixime and all the excipients used in the study showed no interaction between them and indicated that they were compatible with each other. The IR spectras are shown in figure 6, 7 and 8.

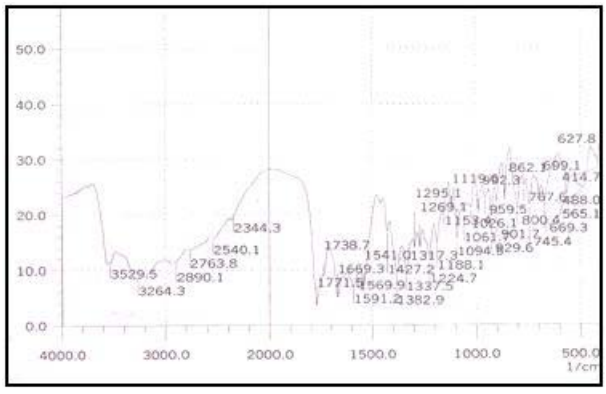

Figure 6: IR Spectrum of Cefixime trihydrate

Thermal analysis

DSC and TGA studies were conducted to check for possible drug excipients interaction and also find the thermal stability of the formulations. TGA along with DSC approach provides both pieces of characterization

information making data interpretation easier and more conclusive.

The DSC of Cefixime and the selected formulations F9 and F16 yielded three transitions as shown in figure 9, 10 and 11. One exothermic peak and two endothermic peaks as given in Table 11. For Cefixime it was found to be 104.9°C 183.53° C and 251.13°C. The second endothermic peak which is 251.13°C is the melting peak which corresponded with the melting point of Cefixime. The formulations F9 and F16 also showed persistence of endothermic peaks (reduced area). F9 showed a melting peak at 253.02°C and F16 showed a melting peak at 252.00°C. This result corresponded with the melting point of Cefixime and the persistence of the melting point in the selected formulations showed that no drug excipients interaction has taken place in the selected formulations.

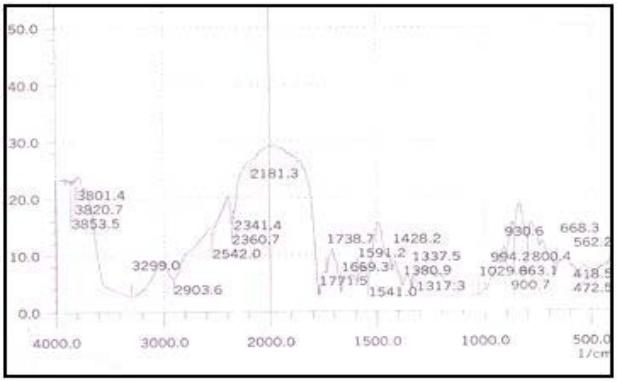

Figure 7: IR Spectrum of formulation IX

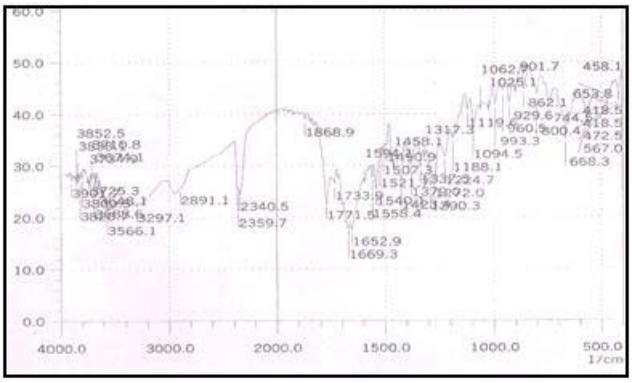

Figure 8: IR Spectrum of formulation XVI

DSC results:

Instruments used : Mettler Toledo, DSC 821

Atmosphere : Nitrogen gas with flow rate of 100ml/min.

Test conditions : 30^0- 300^0C with heating rate of 10^0C/min rise.

Table 11: Exothermic Peak and Two Endothermic Peaks of Pure drug and formulations

Sample	I transition		II transition		III transition	
	T_{top}	ΔH	T_{top}	ΔH	T_{top}	ΔH
A (Pure drug)	104.98	-154.54	183.53	62.93	251.13	233.37
B (F_9)	82.91	-22.77	171.50	16.18	253.02	68.94
C(F_{19})	93.72	-19.59	183.96	15.94	252.00	57.70

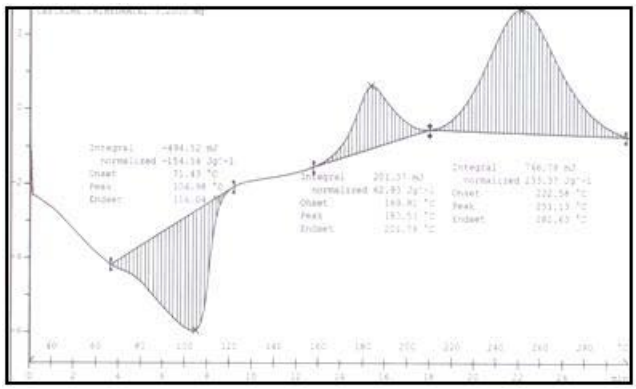

Figure 9: DSC Spectrum of Cefixime trihydrate

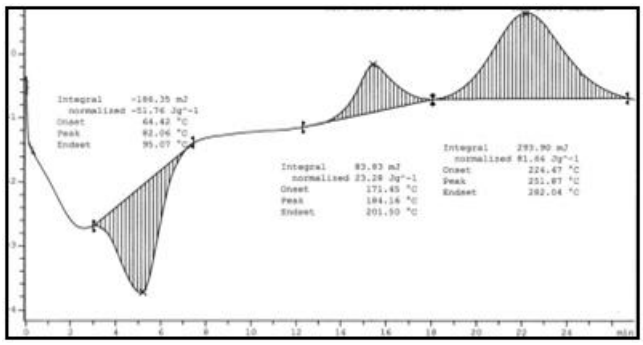

Figure 10: DSC Spectrum of formulation IX

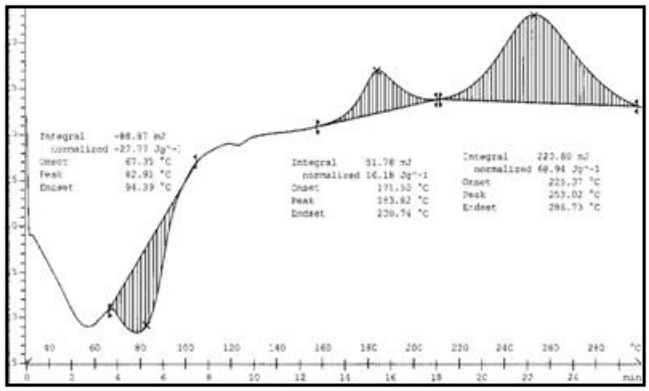

Figure 11: DSC Spectrum of formulation XVI

The TGA results show that the sample undergoes a significant mass loss between 50^0C and 120^0C and this made the assignment of the exothermic DSC attributable to the loss of volatiles (water). In addition to revealing the loss of volatiles at the peak of 104.98^0C the TGA results reveal that the material undergoes its main thermal decomposition at 211.07^0C. The total mass loss is 73.26%. The DSC results reveal that the sample shows signs of degradation at 183.53^0 before the main TGA weight loss at 211.07^0C. The DSC results provide information with regard to the thermal stabilities of materials since it can detect pre-cursorily thermal degradation transitions.

Depending on the water content, onset of degradation and residual weight it was found that formulation F_{19} showed greater temperature stability compared to F_9 because water content was less, onset of degradation was higher and total weight loss was low resulting in high residual weight. Therefore F_{19} was less prone to humidity attack and will have good shelf life.

Instruments used	:	TA Instruments, Q 500
Atmosphere	:	Nitrogen gas with flow rate of 100ml/min.
Test conditions	:	300-3000°C with heating rate of 100°C/min rise.

Table 12: TGA results

Sample	-Δm (Total weight loss)	Onset of degradation (^{0}C)	Water content
A(Pure drug)	73.26%	211.07	9.281%
B (F_9)	82.14%	212.55	7.383%
C(F_{19})	77.92%	216.86	6.798%

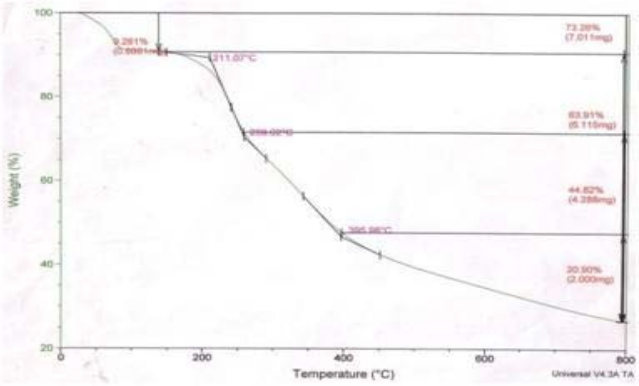

Figure 12: TGA Spectrum of Cefixime trihydrate

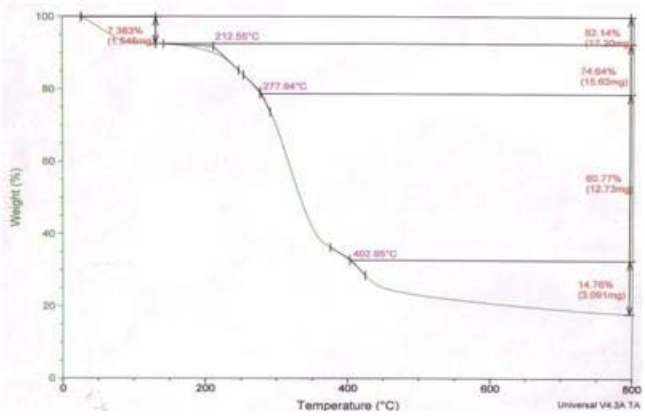

Figure 13: TGA Spectrum of formulation IX

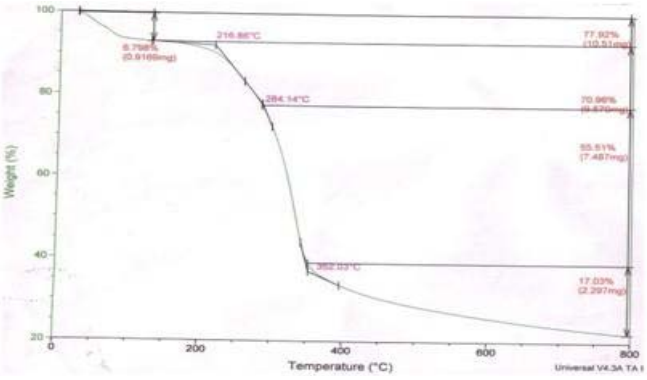

Figure 14: TGA Spectrum of formulation XVI

Stability Studies

The formulations F_9 and F_{19} were selected for stability studies based on their results.

Short term stability study was carried out for a period of 3 months. The selected formulations had a residual drug content of more than 97.5% after 3 months when stored at 25°C at /60%RH and 40°C at 75%RH. The disintegration time after 3 months found to be 17 seconds and 28 seconds for the formulations F_9 and F_{19} respectively. These results indicate that the selected formulations were stable. Also the aged samples showed no change in the physical appearance, disintegration time, hardness, taste, dissolution or drug content

CONCLUSION

Water dispersible tablet was successfully formulated using super disintegrants, which gave a disintegration time of 15 seconds and a hardness of 2.5Kg/cm^2. It had sufficient mechanical strength so as to withstand the course of manufacture and subsequent packaging and distribution. FTIR, DSC and TGA studies revealed that there is no chemical interaction of the drug with the excipients used. Present study has demonstrated the successful utilization of technique of DSC and TGA to assess the compatibility of Cefixime with the excipients used in the development of dispersible tablets of Cefixime. The DSC and TGA results gave valuable information regarding the water loss and thermal stability of the formulations and in arriving at a better conclusion as to the best formulation

REFERENCES

1. Martindale. The complete drug reference, 34th edition, Pharmaceutical press, Royal pharmaceutical society of Great Britian, 2005; 172- 173.
2. The United States pharmacopoeia, USP 29/NF 24, Asian edition, Twin brook parkway, Rockvillie, printed in Canada, 2005; 411-412.
3. Simone Schiermeier, Peter Christian Schmidt, Fast dispersible Ibuprofen tablets, European Journal of Pharmaceutical Sciences,15:2002; 295-305.
4. Lachman L, Lieberman HA, Kanig LJ, Theory and practice of industrial pharmacy, 3rd edition, Varghese publishing house, Bombay, India, Varghese publishing house, 1991; 293-345.
5. Lachman L, Lieberman HA, Pharmaceutical Dosage Forms: Tablets, New York, Marcel Dekker Inc, 1:1980;110-184.
6. Kohli DPS, Shah DH, Drug formulations manual, New Delhi, India, Eastern publishers, 2000; 4-10.
7. British Pharmacopoeia. vol. I and II: 1993; 755.
8. Tony Nunn, Julie Williams, Formulation of medicines for children, British journal of pharmacology, 2004; 674-676.
9. Geraro AR, Remington's pharmaceutical sciences. 18th Edition. Mack publishing co, Eastern pennsylvania, 1990; 560, 1996 and 6006.
10. Goodman and Gilman's, The pharmacological basis of therapeutics. 10th edition, edited by Joel G Hardman, lee E Limberd, Mc Graw Hill Medical Publishing Division, New York, 10th edition: 2002; 2001- 1206.

11. Ainley Wade and Paul J weller, Hand book of pharmaceutical Excipients, 2nd Edition, published by The American pharmaceutical Association Washington: 1994; 84,143,280,519.
12. USP/NF. Asian Edition, Twinbrookparkway, Rockwillas. 2006: 411-412.
13. Shankar DG, UV and visible spectropotometric methods for determination of cefixime, Indian drug: 2001; 38.
14. Martindale, The complete drug reference, 34th edition, Pharmaceutical press: Royal pharmaceutical society of Great Britian: 2005; 172- 173.
15. The United States pharmacopoeia, USP/NF, Asian edition, The United States pharmacopoeial convention, Twinbrookway. Rockville: 2006; 411-414.

Source of Support: Nil, **Conflict of Interest:** None.