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# DESIGN AND *IN VITRO* EVALUATION OF EPLERENONE SUSTAINED RELEASE TABLETS FOR ORAL CONTROLLED RELEASE

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**ABSTRACT**

**Aim:** The objective of this study was to develop sustained release tablets of Eplerenone to improve the oral bioavailability and to reduce the dose dependent toxicity. **Materials and Methods:** Weighed required quantities of polymers and drug passed through mesh 80. Then mixed with isopropyl alcohol and prepare wet mass. That wet mass is passed through 40 mesh to form granules and prepared sustained release tablets of Eplerenone formulations by wet granulation technique. **Results and Discussion:** The drug-excipient mixtures were subjected to preformulation studies. The tablets were subjected to physico-chemical studies. No interaction between drug and polymers were identified by FTIR studies. The physic-chemical properties of tablets were found within limits. Eplerenone tablets were used for the treatment of hypertension and heart failure. The drug released from optimized formulation (F3) was extended for a period of 12 h. The release of drug follows zero order kinetics. The optimized formulation (F3) was subjected to stability studies and shown there were no significant changes in drug content and release pattern. **Conclusion:** Thus the F3 formulation (Eplerenone-HPMC) is suitable for sustained release over a period of 12 h.

## INTRODUCTION

The oral route method of drug delivery [1] administration is the most convenient and commonly used. Sustained release system is a type of modified drug delivery system which can be used as an alternative to conventional system. In different dosage forms, matrix tablets are widely accepted for oral sustained release. [2] Sustained release system has benefits like patient compliance, avoid side effects, maintain uniform therapeutic level, cost effective and overcome the problems associated with conventional drug delivery systems. [3-4] Eplerenone is used for the Treatment of hyptertension and heart failure. It is a steroid nucleus-based anti mineral corticoid that is chemically and enzymatically interconvertible to an open lactone ring form. It is rapidly and nearly completely absorbed from the gastro intestinal tract following oral ingestion, showing 69% bioavailability and the plasma half-life is 4 h. [5] Eplerenone is a low soluble-high permeable drug (BCS class II). [6-7] Although conventional tablets of Eplerenone are available in the market commercially, no study has been done so far for preparing the Eplerenone sustained release

tablets. To improve the patient compliance there is a need for the development of sustained release formulations. So that an attempt has been made to develop the sustained release formulation by using different polymers like Ethyl cellulose, HPMC and Xanthan gum for prolonged action and to improve patient compliance. [8-9]

## MATERIALS AND METHODS

### Materials

Eplerenone was a gift sample from Pfizer Company Pvt. Ltd, Hyderabad. HPMC K15M and Ethyl Cellulose were obtained from Yarrow chem. products, Mumbai. Xanthan gum was obtained from Reachem laboratory, Mumbai. Micro crystalline cellulose, Magnesium Stearate, Talc, Isopropyl Alcohol that are used in the preparation of these tablets are of pharmaceutical grade.

### Preparation of matrix tablets

#### *Preparation of granules*

Weighed required quantities of Eplerenone, HPMC, Ethyl cellulose and Xanthan gum were passed through 80 mesh to remove lumps a required quantity of Isopropyl alcohol was sprinkled over powder blend to obtain wet mass. That wet mass is passed through 40 mesh to form granules. Thus the obtained granules were air dried. After drying the dried granules were passed through 16 mesh and the flow properties were determined.

#### *Evaluation of granules*

The granules of all the formulations were characterized for their flow properties.

#### *Angle of repose (Θ)*

Angle of repose can be measurement by the frictional forces of granules.[10] This is the maximum angle possible between the surface of a pile of powder or granules and the horizontal plane. The funnel fixed to a stand at definite height and allowed the granules for flow. By measuring the height and radius of the heap of granules formed the angle of repose was calculated.

$$\mathbf{Tan\ (\Theta) = h/r}$$

Where, is the angle of repose, h = height, r = radius

#### *Bulk density*

Both loose bulk density (LBD) and tapped density (TBD) were determined for the prepared granules. The required amount of sample was weighed and taken in a 25 ml measuring cylinder of borosil measurement/recorded the volume of packing recorded and LDB and TBD calculated by following:

**LBD (Loose Bulk Density) = Mass of Powder/Untapped Volume of Powder**

**TBD (Tapped Bulk Density) = Mass of Powder/Tapped Volume of Powder.**

#### *Hausner's ratio*

Flow properties of the prepared granules were determined by Hausner's ratio calculated by following formula:

**H = Tapped bulk density/Lose bulk density**

#### *Carr's compressibility Index*

Compressibility of granules percentage was determined by Carr's compressibility index, calculated by following formula:

$$\mathbf{Carr's\ Index = [(TBD - LBD)/TBD]\times 100}$$

**Procedure for preparation of tablets:** Sustained release matrix tablets of Eplerenone with HPMC K15M, Ethyl cellulose and Xanthan gum were prepared by using conventional wet granulation method by using Isopropyl alcohol. HPMC K15M, Ethyl cellulose and Xanthan gum were used as matrix forming materials while magnesium stearate as a lubricant. The prepared granules were weighed and then to this Magnesium stearate and talc were added and then compressed as a tablet with 8 mm flat punches using 6 – station rotary tablet punching machine.

### Evaluation of tablets

#### *Hardness*

Hardness is defined as the force required breaking a tablet in diametric compression test and it is used for tablet crushing strength. The crushing strength ($Kg/cm^2$) of tablets was determined by using Monsanto hardness

tester. In all the cases, mean of three replicate determinations were taken.

***Thickness***

Uniformity of tablet size important for the thickness of tablet. Thickness was measured using Vernier callipers. In each formulation checking 10 tablets for determined of thickness.

***Friability test***

Weighing accurately 10 tablets, placing them in the friabilator. Then rotating the plastic cylinder vertically at 25 rpm for 4 min. The percent friability was calculated after dusting; the total remaining weight of the tablets was recorded and according to

**%Friability = [(W in initial – W in final)/W in initial] ×100**

***Weight variation***

Twenty tablets were taken and weighed individually on a digital weighing balance. Total average weight was calculated and the individual tablet weight was compared to the average. If no more that 2 tablets are outside the percentage the tablet pass the U. S. P. test limit and if no tablet differs by more than 2 times the percentage limit.

***Determination of drug content***

Five tablets from each formulation were powdered. The powdered sample equivalent to 40 mg of drug was transferred to a 100 ml volumetric flask. 10 ml of methanol was added and shaken. Required amount of media was added to make up the volume, mixed and filtered. The filtrate was suitably diluted with media and analyzed by using UV spectrophotometer at 245 nm (ELICO SL 159) against blank.

***In vitro dissolution studies***

The *in vitro* drug release study was carried out in USP II Dissolution rate test apparatus with a rotating paddle stirrer (M/s Lab India (Mode-DS 8000) at 50 rpm and 37 ± 0.5ºC. The study was done in 0.1 N HCl medium for 2 hours and later with 6.8 pH phosphate buffer up to 12 hours. Sink condition was maintained for the whole experiment. Samples (5 ml) were withdrawn at regular intervals and the same volume of pre-warmed (37±0.5°) fresh dissolution medium was replaced to maintain the volume constant. The withdrawn samples of dissolution fluid were assayed at 245 nm for Eplerenone content using a UV/Visible spectrophotometer[11] (Elico SL-159 double beam Spectrophotometer). The dissolution test was performed in triplicate. Then cumulative percent drug release versus time curve was plotted for drug dissolved at a specified time periods.

***Kinetics of drug release***

The kinetics of drug release from the matrix was determined by fitting the appropriate drug release data to zero order, first order, Higuchi equation, and Korsemeyer-Peppas model. The criteria for selecting the most appropriate model were chosen on the basis of goodness of fit test. [12-13]

$C = C_o\, t$ (Zero order)

$\text{Log } C = \text{Log } C_o - kt/2.303$ (First order)

$Q = kt^{1/2}$ (Higuchi model)

$M_t/M_r = kt^n$ (Korsemeyer-Peppas model)

Where Q is amount of drug release at time *t*, $C_o$ is the initial amount of drug, *k* is the kinetic constant for zero order, first order, Higuchi and Korsemeyer-Peppas models and *n* is the release exponent.

***FTIR Studies***

Compatibility study of Eplerenone with excipients was determined I.R Spectroscopy using FT-IR spectrophotometer. The FTIR spectra of Eplerenone with HPMC-K15M indicated the characterstics absorption stretch for (C=O) at frequency 1773$cm^{-1}$. (1600-1900); (C–C) at frequency 1268$cm^{-1}$. (900-1300) Eplerenone with Ethyl Cellulose the absorption peak at (C- H) hydrogen group at 2972.25$cm^{-1}$., (2700-3300); (C-C) at 1658$cm^{-1}$., (1600-1700; (C-O) at 1022.86$cm^{-1}$., (900-1300). Eplerenone with Xanthan Gum the absorption peak at (C=O) at 1726$cm^{-1}$., (1600-1900); (C-C) at 1657.85$cm^{-1}$., (1600-1700). This indicates the absence of any interactions for the drug with excipients used. The sustained release tablets of Eplerenone were prepared by using HPMC-K15M, Ethyl Cellulose and Xanthan Gum.

***Stability studies***

Accelerated stability studies were performed on optimized batch according to ICH guidelines. Stability study of optimized batch (F3) was carried out at accelerated storage condition at temperature $40^0 \pm 2^0$ C and 75% ± 5% RH in a humidity chamber for 3 months and samples were withdrawn after every month. The samples were analysed for hardness, friability and *in vitro* drug release.

## RESULTS AND DISCUSSION

**Drug-Excipient compatibility studies**

The Drug-Excipient compatability studies were conducted with different ratios of drug: excipients admixtures at 40 ± 2ºC and 75 ± 5% RH for 1month and the samples were observed for any physical change after each week. No physical change was observed. The samples were then analysed by FT-IR spectroscopy for any interactions. The FTIR spectrum of Eplerenone was shown in Figure 6 and the spectra of excipients and admixtures were shown in the figures 7-9. The FTIR spectra of Eplerenone with HPMC-K15M indicated the characterstics absorption stretch for (C=O) at frequency 1773$cm^{-1}$. (1600-1900); (C–C) at frequency 1268$cm^{-1}$., (900-1300). Eplerenone with Ethyl Cellulose the absorption peak at (C-H) hydrogen group at 2972.25$cm^{-1}$., (2700-3300); (C-C) at 1658$cm^{-1}$., (1600-1700; (C-O) at 1022.86$cm^{-1}$., (900-1300). Eplerenone with Xanthan Gum the absorption peak at (C=O) at 1726$cm^{-1}$., (1600-1900); (C-C) at 1657.85$cm^{-1}$., (1600-1700). This indicates the absence of any interactions for the drug with excipients used. The sustained release tablets of Eplerenone were prepared by using HPMC-K15M, Ethyl cellulose, Xanthan gum.

**Pre compression parameters**

The granules prepared for compression of the sustained release tablets were evaluated for their flow properties and were shown in the Table 2. The bulk density of all the formulations were within the range of 0.225 to 0.435 g/ml and tapped density was found to be in the range of 0.271to 0.464 g/ml which indicates the powder was not bulky. The Angle of repose of all formulation was found to be in the range of 18.26 to 26.56 showing good flow property of granules. The calculated Carr's index and Hausner's ratio of all formulations was found to within the range of 10.49 to 16.25 and 1.05% to 1.29% respectively indicating the compressibility of tablet blend is good. The values of pre-compressional parameters evaluated were within the prescribed limits and indicated good free flowing properties.

**Post Compression parameters**

The physical characters of all the prepared tablets like uniformity of weight, thickness, hardness friability and drug content were shown in Table 3. The hardness of the prepared sustained release tablets was measured by Monsanto hardness tester and was controlled between 4 to 4.5 kg/$cm^2$ The loss of percentage of weight in friability was found to be 0.17 to 0.64% which is less than 1% which indicates tablets have good mechanical resistance. The thickness of prepared tablets was measured by Vernier caliper and found to be in the range of 1.05 to 1.68. The weight variation of all formulations was found to be within the range of 98 to 101 mg showing satisfactory results as per I.P. The percentage of Drug content for all the prepared formulations (F1-F9) was found to be in the range of 96 to 99% of Eplerenone, it complies with official specifications.

***In vitro* drug release studies**

The results of *in vitro* drug release studies were shown in Tables 4, 5. Drug release from different formulations was found to depend on different types of polymer and its concentration. The formulations F1-F3 containing HPMC showed a better property of controlling the drug release because of its hydrophilic nature. Formulations F4-F6 having Ethyl cellulose haven't show proper release due to its hydrophobic nature. Xanthan gum formulations F7-F9 could not control the release of drug due to its fast uptake of water and swelling nature. Hence the F3 formulation showed better control over drug release about 96.29% (at the end of 12 hours.) due to its increase in concentration of polymer.

**Table 1: Formulation of sustained release eplerenone tablets**

| Ingredients (Weight in mg) | F1 | F2 | F3 | F4 | F5 | F6 | F7 | F8 | F9 |
|---|---|---|---|---|---|---|---|---|---|
| Eplerenone | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 |
| HPMCK15M | 20 | 30 | 40 | - | - | - | - | - | - |
| Ethyl cellulose | - | - | - | 20 | 30 | 40 | - | - | - |
| Xanthan gum | - | - | - | - | - | - | 20 | 30 | 40 |
| MCC | 50 | 40 | 30 | 50 | 40 | 30 | 50 | 40 | 30 |
| Isopropyl alcohol | q.s | q.s | q.s | q.s | q.s | q.s | q.s | q.s | q.s |
| Magnesium Stearate | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Talc | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Total weight | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Table 2: Pre compression parameters of Formulations F1-F9**

| Formulation Code | Bulk density (g/ml) | Tapped density (g/ml) | Angle of Repose (Ɵ) | Carr's Index (%) | Hausner's Ratio |
|---|---|---|---|---|---|
| **F1** | 0.228 | 0.271 | 23.26 | 15.86 | 1.188 |
| **F2** | 0.225 | 0.264 | 18.26 | 14.77 | 1.173 |
| **F3** | 0.231 | 0.272 | 21.30 | 15.07 | 1.177 |
| **F4** | 0.364 | 0.428 | 26.56 | 14.61 | 1.175 |
| **F5** | 0.419 | 0.450 | 24.22 | 14.18 | 1.073 |
| **F6** | 0.435 | 0.464 | 23.26 | 16.25 | 1.066 |
| **F7** | 0.250 | 0.324 | 23.16 | 10.49 | 1.296 |
| **F8** | 0.290 | 0.349 | 24.26 | 16.90 | 1.203 |
| **F9** | 0.267 | 0.313 | 20.30 | 14.69 | 1.170 |

**Table 3: Post compression parameters of Formulations F1-F9**

| Formulation Code | Hardness ($kg/cm^2$) | Friability (%) | Thickness (mm) | Weight Variation (in mg) | Drug content (%) |
|---|---|---|---|---|---|
| **F1** | 4.0 ± 0.25 | 0.52 | 1.17 | 99 ± 0.5 | 99.46 |
| **F2** | 4.0 ± 0.5 | 0.35 | 1.14 | 98 ± 0.56 | 99.87 |
| **F3** | 4.5 ± 0.25 | 0.33 | 1.68 | 99 ± 0.45 | 99.12 |
| **F4** | 4.0 ± 0.25 | 0.16 | 1.05 | 101 ± 0.60 | 98.84 |
| **F5** | 4.0 ± 0.5 | 0.50 | 1.47 | 98 ± 0.56 | 97.52 |
| **F6** | 4.0 ± 0.5 | 0.64 | 1.11 | 99 ± 0.59 | 98.03 |
| **F7** | 4.5 ± 0.5 | 0.17 | 1.51 | 98 ± 0.65 | 96.33 |
| **F8** | 4.5 ± 0.25 | 0.87 | 1.48 | 99 ± 0.62 | 98.37 |
| **F9** | 4.0 ± 0.5 | 0.17 | 1.28 | 99 ± 0.65 | 97.64 |

Table 4: *In vitro* drug release data of formulations F1-F4

| Time (in hrs) | Cumulative percentage (%) Drug Release (X ± S.D) | | | |
|---|---|---|---|---|
| | **F1** | **F2** | **F3** | **F4** |
| **0** | 1.80 ± 0.35 | 2.05 ± 0.11 | 3.08 ± 0.35 | 2.05 ±0.39 |
| **0.5** | 4.90±0.11 | 5.42 ± 0.24 | 8.26±0.11 | 4.01 ±0.18 |
| **1** | 8.15±0.19 | 8.80 ± 0.35 | 11.79±0.19 | 8.01 ±0.72 |
| **2** | 10.12±0.12 | 11.54 ± 0.24 | 15.81±0.12 | 11.79 ± 0.55 |
| **3** | 20.94 ± 0.16 | 25.74 ± 0.40 | 29.38 ± 0.16 | 20.97 ± 0.97 |
| **4** | 33.99 ± 0.17 | 35.81 ± 0.13 | 42.77 ± 0.17 | 31.94 ± 0.95 |
| **5** | 43.33 ± 0.35 | 49.86 ± 0.18 | 54.67 ± 0.35 | 43.31 ± 0.95 |

| | | | | |
|---|---|---|---|---|
| **6** | 49.90 ± 0.42 | 58.83 ± 0.25 | 64.03 ± 0.42 | 50.41 ± 0.73 |
| **7** | 56.33 ± 1.46 | 68.64 ± 0.26 | 74.33 ± 1.46 | 57.48 ± 0.96 |
| **8** | 67.16 ± 1.22 | 75.91 ± 0.17 | 84.16 ± 1.22 | 66.42 ± 0.47 |
| **10** | 76.05 ± 0.21 | 87.49 ± 0.35 | 90.05 ± 0.21 | 70.09 ± 0.73 |
| **12** | 80.29 ± 0.31 | 90.60 ± 0.40 | 96.29 ± 0.31 | 74.56 ± 0.72 |

**Table 5: *In vitro* drug release data of formulations F5-F9**

| Time (in hrs) | Cumulative percentage (%) Drug Release (X ± S.D) | | | | |
|---|---|---|---|---|---|
| | **F5** | **F6** | **F7** | **F8** | **F9** |
| **0** | 1.79 ± 0.35 | 1.54 ± 0.28 | 2.31 ± 0.26 | 2.05 ± 0.38 | 2.05 ± 0.31 |
| **0.5** | 3.23 ± 0.55 | 2.72 ± 0.55 | 4.39 ± 0.36 | 3.36 ± 0.37 | 3.34 ± 0.73 |
| **1** | 4.66 ± 0.35 | 3.76 ± 0.55 | 9.30 ±1.08 | 7.23 ± 0.73 | 6.08 ± 0.92 |
| **2** | 6.86 ± 0.54 | 6.72 ± 0.73 | 14.88 ± 1.28 | 11.13 ± 0.75 | 7.91 ± 0.56 |
| **3** | 14.93 ± 0.73 | 12.71 ± 0.97 | 25.78 ± 1.46 | 19.59 ± 0.95 | 19.55 ± 0.97 |
| **4** | 26.93 ± 0.73 | 22.99 ± 0.99 | 38.13 ± 1.40 | 33.97 ± 0.95 | 28.17 ± 0.94 |
| **5** | 35.41 ± 0.97 | 31.96 ± 0.97 | 49.00 ± 1.22 | 43.33 ± 0.47 | 36.27 ± 1.21 |
| **6** | 45.22 ± 1.21 | 42.28 ± 0.94 | 56.10 ± 0.98 | 52.63 ± 0.96 | 47.44 ± 0.97 |
| **7** | 55.72 ± 1.46 | 51.60 ± 0.98 | 68.11 ± 1.46 | 64.15 ± 1.21 | 59.15 ± 0.93 |
| **8** | 63.16 ± 0.74 | 59.19 ± 0.95 | 75.56 ± 0.74 | 71.77 ± 0.73 | 67.80 ± 0.97 |
| **10** | 67.84 ± 1.45 | 63.19 ± 0.73 | 86.79 ± 0.97 | 80.59 ± 0.96 | 75.61 ± 0.73 |
| **12** | 71.30 ± 0.98 | 67.67 ± 0.72 | 88.71 ± 0.73 | 82.17 ± 0.73 | 77.86 ± 0.97 |

**Table 6: List of correlation coefficient values (r) for various mathematical models for sustained release tablets of Eplerenone**

| FORMULATION CODE | ZERO ORDER ($R^{2)}$ | FIRST ORDER ($R^{2)}$ | HIGUCHI ($R^{2)}$ | PEPPA'S n | |
|---|---|---|---|---|---|
| F1 | 0.9728 | 0.9815 | 0.9644 | 0.9002 | 1.655 |
| F2 | 0.9673 | 0.9677 | 0.9237 | 0.9808 | 1.694 |
| F3 | 0.962 | 0.9505 | 0.9342 | 0.8576 | 1.665 |
| F4 | 0.9566 | 0.9813 | 0.9281 | 0.8825 | 1.608 |
| F5 | 0.9557 | 0.9689 | 0.8948 | 0.9366 | 1.699 |
| F6 | 0.9581 | 0.9682 | 0.8881 | 0.9464 | 1.684 |
| F7 | 0.9688 | 0.9697 | 0.9323 | 0.8684 | 1.643 |
| F8 | 0.9617 | 0.9717 | 0.9134 | 0.9529 | 1.677 |
| F9 | 0.9651 | 0.967 | 0.8989 | 0.927 | 1.699 |

**Table 7: Stability studies of the best formulation (F3)**

| S.No | Test | Initial | After 3 months |
|---|---|---|---|
| 1 | Appearance | White | White |
| 2 | Hardness | 4.5 | 4.5 |
| 3 | Friability | 0.33 | 0.33 |
| 4 | Disssolution in phosphate buffer pH6.8 | 96.29% (at the end of the 12hrs) | 96.18% (at the end of the 12hrs) |

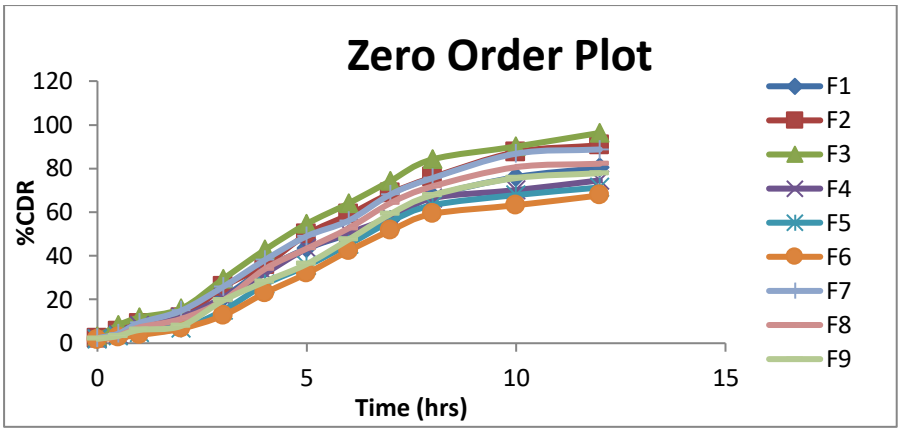


**Figure 1: Zero order plots (Cum %drug release Vs Time) of Formulations F1-F9**

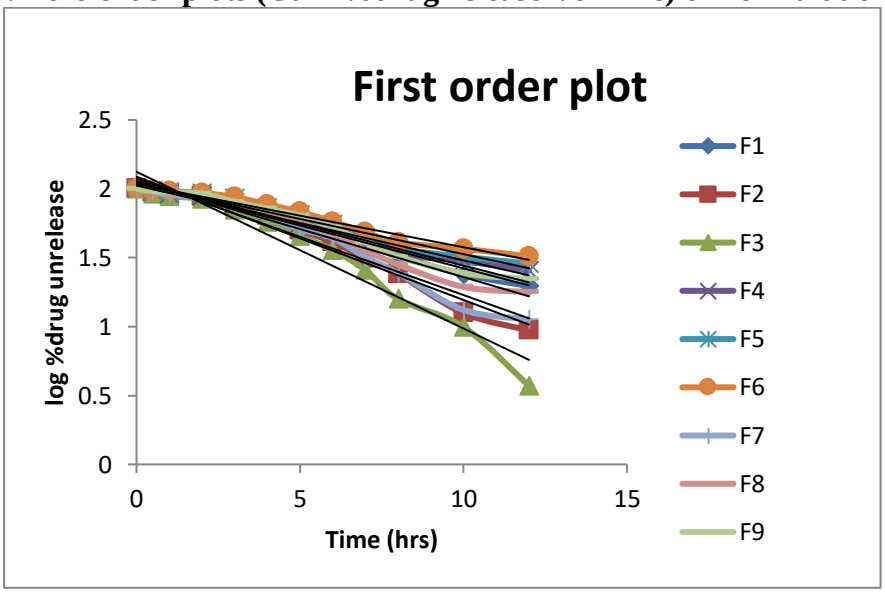


**Figure 2: First order plots (Log cum %drug remaining Vs Time) of Formulations F1-F9**

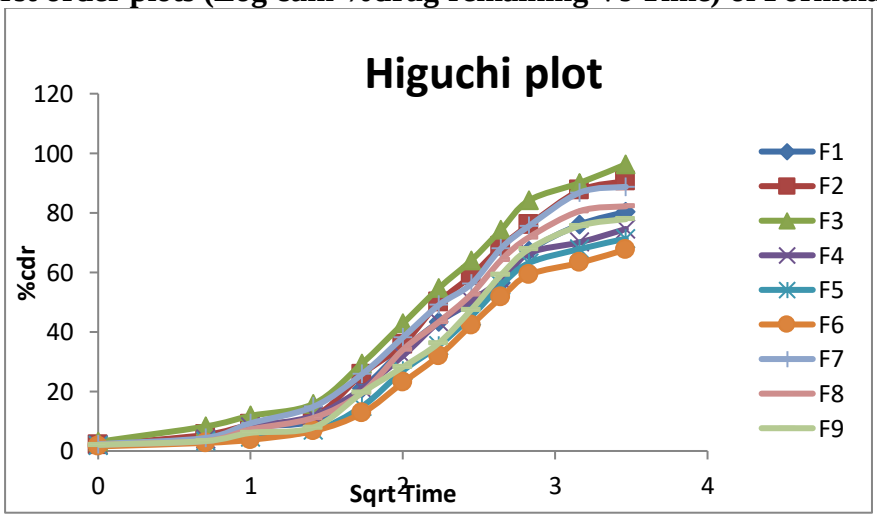


**Figure 3: Higuchi plots (Cum %drug release Vs square root of time) of Formulations F1-F9**

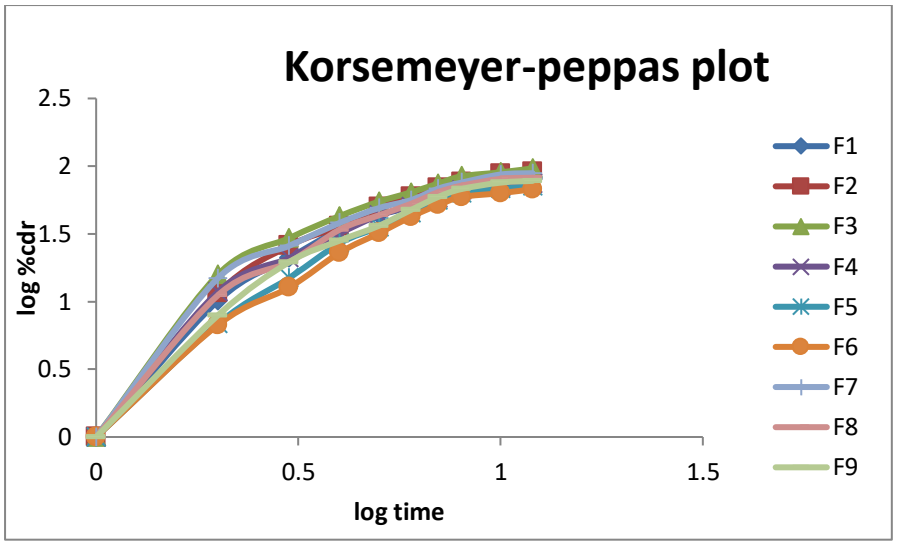


**Figure 4: Korsemeyer-Peppa's plot (Log %drug release Vs Log Time) of Formulations F1-F9**

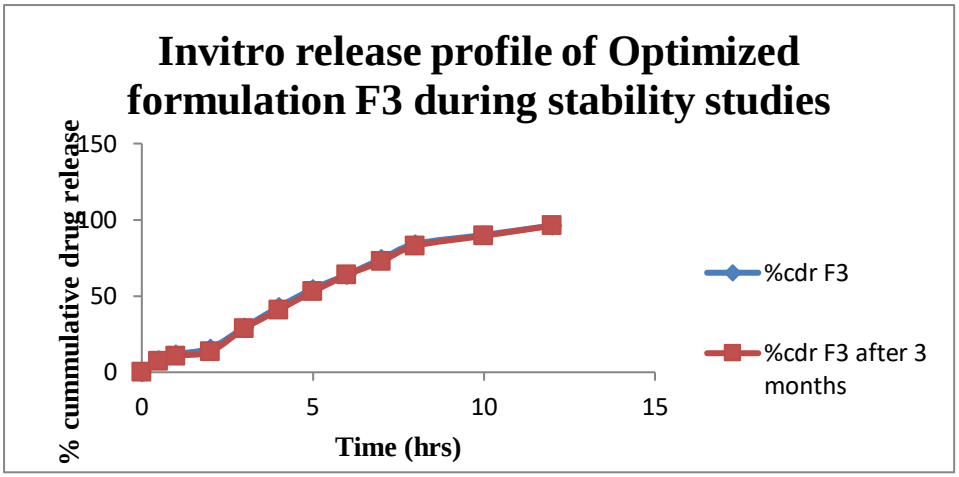


**Figure 5: *In vitro* release profile of optimized formulation F3 during stability studies**

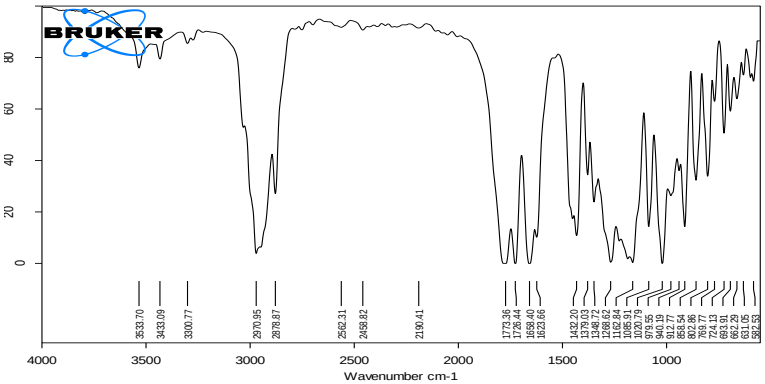


**Figure 6: FTIR of Eplerenone**

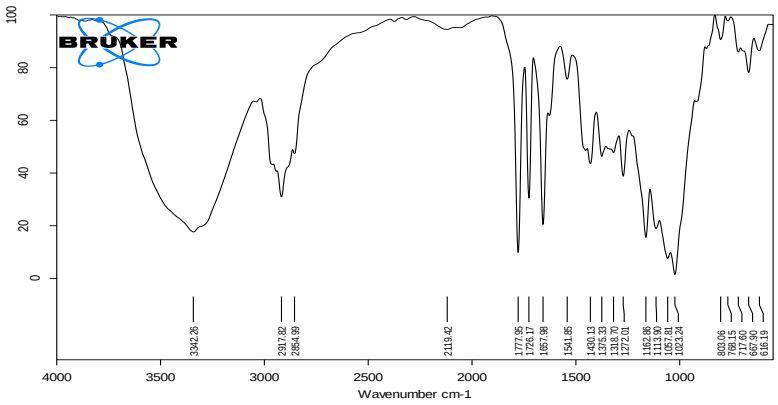


**Figure 7: FTIR of Eplerenone+HPMCK15M**

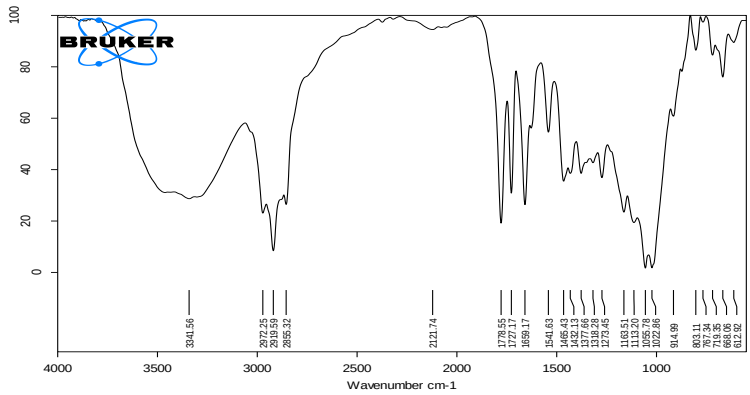


**Figure 8: FTIR of Eplerenone+Ethylcellulose**

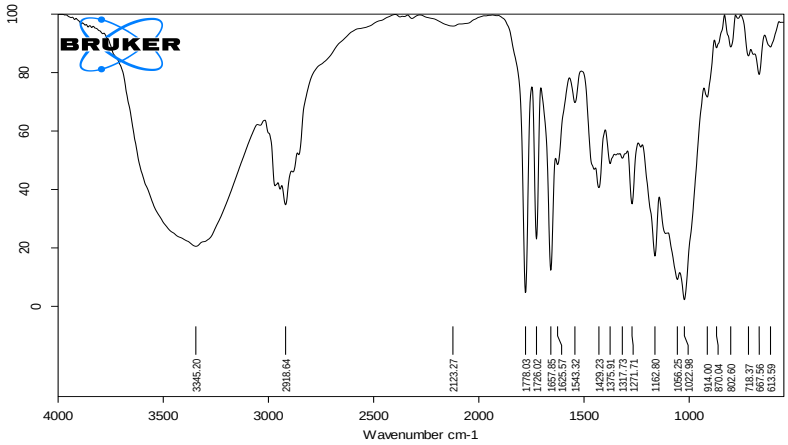


**Figure 9: FTIR of Eplerenone + Xanthan gum**

## Analysis of drug release data

Release kinetics of the data obtained from *in vitro* dissolution studies were fitted in different models viz. zero order, first order, Higuchi and Korsemeyer-Peppas equation. The correlation coefficient (r) values of above 0.950 for zero order indicate that the sustained release eplerenone tablets follow zero order kinetics. The r- values above 0.9 Higuchi plots indicates the drug release via diffusion mechanism from hydrophilic matrices. In order to know the type of diffusion the data was fitted to Korsemeyer-Peppas model and the values of diffusion coefficient (n) were obtained from slope of the plots. To identify the mechanism of drug release from these tablets, the data were fitted according to Korsemeyer-Peppas equation. A value for n for all matrices studied here was ranged between 1.608 to 1.699, indicating an anomalous behaviour corresponding to

swelling, non-fickian diffusion and erosion mechanism.

**Stability studies**

Stability studies were conducted for the best formulation F3 as per ICH guidelines for a period of 3months and the results were shown in table 7.The results indicate that there was no significant change in appearance, hardness and friability. However there was a slight variation in the *in vitro* drug release at the end of 12 hrs. It was concluded that the tablets were stable during the study period. The FT-IR spectrum of the best formulation F3 was shown in figure-4. The presence of characteristic peaks at (C=O) at frequency 1773cm$^{-1}$. (1600-1900); (C–C) at frequency 1268cm$^{-1}$. (900-1300) indicate that no significant interactions exist between drug and excipients.

## CONCLUSION

The nature (i.e., hydrophilic or hydrophobic concentration) of polymer, that required the release rate of drug can be attributed. On studying all the experimental results of the prepared formulations, it can be concluded that Sustained release tablets of Eplerenone can be successfully prepared using HPMC K15M (Hydrophilic polymer), Ethyl cellulose (Hydrophobic polymer) and Xanthan gum (Natural gum). It was observed that release of Eplerenone from different formulations was spread over a period of 6-12 hours depending on the concentration of the polymer used. The order of retardation of drug release from different polymers is: Xanthan gum < EthylCellulose < HPMC K15M.n The *in vitro* dissolution profiles are sustained over a period of 12 hours and the release of the drug from the formulations was found to follow zero order kinetics and the mechanism was found to be non-Fickian diffusion. Among the various sustained release formulations studied, formulation F3 containing HPMC K15M at a proportion of 40% of tablet weight showed promising results releasing 100% of the drug in 12 hours which has been considered as an ideal formulation and subjected to further short term stability studies. The Stability studies for the Optimized formulation F3 has been conducted for over a period of 3 months and there is no differences were observed over a period of time.

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