

# DEVELOPMENT AND EVALUATION OF ENTARIC COATED RABEPARAZOLE SODIUM 50 MG TABLET FOR ENHANCE GASTRO RESISTANCE AND STABILITY

Mr. Saurabh Vitthal Dahatonde <sup>1</sup>, Dr Abhijeet Raosaheb Shete <sup>2</sup>, Dr. Magha T. Salve <sup>3</sup>

<sup>1</sup>Student in Shivajirao pawar college of pharmacy Newasa Maharashtra, India

<sup>2</sup>Professor at Shivajirao pawar college of pharmacy Newasa Maharashtra, India

<sup>3</sup>Principal at Shivajirao pawar college of pharmacy Newasa Maharashtra, India

## ABSTRACT

Rabeprazole sodium is a proton pump inhibitor that works by blocking the acidic pump enzyme H<sup>+</sup>/K<sup>+</sup>ATPase, which is used to treat peptic ulcers, duodenal ulcers, and gastro-oesophageal reflux disease. Additionally, it is used to treat erosive esophagitis and Zollinger-Ellison syndrome. The goal of this research is to create enteric-coated tablets of Rabeprazole sodium that are stable and pharmaceutically equal to the original product. The goal of the current work is to prevent drug breakdown in the stomach's acidic environment. Mannitol as diluents, magnesium stearate and talc as lubricants and glidants, ethyl cellulose as a seal coating, Eudragit L-30, Plasacrylic HTP, and Instacoat EN HPMC Pthalate as an enteric coating were used to create ten different formulations of Rabeprazole core tablets. F9 outperformed the innovator in terms of drug release profile among the 10 batches of uncoated tablets. As a result, batch F9 was chosen for enteric coating and subcoating, two additional formulation stages. Following enteric coating, batches F9 were assessed for acid resistance and in vitro dissolving tests, and they were deemed to be appropriate for Rabeprazole sodium delayed release tablets when compared to innovator. For a duration of three months, stability assessments were performed at 40°C with 75% relative humidity.

**Keywords :** Rabeprazole sodium, gastro oesophageal reflux, Enteric coated tablets, Dissolution, stability

## 1. INTRODUCTION

Gastro esophageal reflux disease (GERD) is a common chronic, relapsing condition caused by the Combination of excess reflux of gastric juice and impaired clearance of this refluxate from the Esophagus. It is one of the most prevalent gastrointestinal disorders affecting all age groups and Carries a risk of significant morbidity and possible mortality from resultant complications thus Affecting the quality of life of the patient. [1,2] GERD is commonly due to transient or permanent changes in the barrier between the esophagus And the stomach, which can be due to incompetence of the lower esophageal sphincter (LES), Transient LES relaxation, impaired expulsion of gastric refluxate from the esophagus, or Association with a hiatal hernia. Reflux of gastric contents can cause esophageal mucosal Abnormalities, such as ulcers and peptic strictures, as well as reflux-induced asthma and acid Laryngitis. Left untreated esophageal adenocarcinoma can develop in approximately 0.2 – 2.0% of Patients with Barrett's esophagus, a complication of GERD.[3-4]Proton Pump Inhibitors (PPIs) are used in the treatment of acid – related gastro – duodenal Disorders by reducing gastric acid secretion. Proton pump inhibitors are substituted benzimidazoles And all share a similar core structure and mode of action, but differ in substituent groups. The type Of substituents affects the chemical properties of the compounds that directly influence their rates Of reactions and therefore their stability in

different media. [5]Rabepazole sodium drug is a sodium salt of 2-((4-(3-methoxypropoxy)-3-methylpyridin-2-yl) Methylsulfinyl)-1H-benzo[d]imidazole belongs to a class of proton pump inhibitors (PPIs). It Suppress gastric acid secretion by specifically inhibiting the H<sup>+</sup>/K<sup>+</sup>- ATPase enzyme system at the Secretory surface of the gastric parietal cell [6]. The aim of proposed work was to formulate and Characterize enteric coated tablets Rabepazole sodium for delayed release of drug in stomach for Treatment of gastric and duodenal ulcers.

## 2.MATERIALS AND METHOD

Materials: Rabepazole sodium (Madras Pharma india), Mannitol (Roquette, France), Eudragit L-30, Plasacrylic HTP, Instacoat EN HPMC Pthalate, Low substituted Hydroxy propyl cellulose (L-HPC, Shinetu Chemicals, Japan), Ethyl cellulose (Colorcon Asiaptvlttd.,India). All other reagents Were of analytical grade.

Methods: Preparation of core Rabepazole sodium tablets:[7,8]The initial trials were taken with dry mixing and direct compression method than follow wet granulation technique because a good distribution and uniform content of low-dosage drugs was possible in wet granulation process. A lab scale trial batch was taken with the following composition, manufacturing procedure and studied for tablet physical and dissolution parameters. The details are given below.

Table 1- Prototype formulation of Rabepazole sodium

Batch NO	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
<b>Ingredients</b>										
<b>Intra granular part:</b>										
Rabepazole Sodium	21.07	21.07	21.07	21.07	21.07	21.07	21.07	21.07	21.07	21.07
Mannitol(Pearlitol DC 400)	30.00	-	-	-	-	-	-	-	-	-
Mannitol powder	-	30	30	71.68	36	36	36	36	36	36
Light magnesium oxide DC	74.93	-	-	-	-	-	-	-	-	-
Light magnesium oxide	-	71.68	71.68	30	65.68	65.18	66.93	68.93	68.93	68.93
Low Substituted Hydroxy Propyl Cellulose LH 11	17.00	17.00	17.00	-	-	-	-	-	-	-
Low Substituted Hydroxy Propyl Cellulose LH 21	-	-	-	17	17	17	5.00	5.00	5.00	5.00
<b>Binder part:</b>										
Hypromellose 6cps	-	1.50	1.50	1.50	1.50	2.00	2.00	2.00	2.00	2.00
Dichloromethane	-	-	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s
Iso propyl Alcohol	-	-	q.s	q.s	q.s	q.s	q.s	q.s	q.s	q.s
<b>Extra granular part:</b>										
Low Substituted Hydroxy Propyl Cellulose LH 21	-	-	-	-	-	-	10.00	10.00	10.00	10.00
Magnesium stearate	2.00	3.75	3.75	3.75	3.75	3.75	2.00	2.00	2.00	2.00
<b>Tablet Wight (Core)</b>	145.00	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0	145.0
<b>SEAL COATING</b>										
Ethyl cellulose	-	-	1.00	1.00	1.00	1.00	2.00	2.00	4.25	4.25
Light magnesium oxide	-	-	1.00	1.00	1.00	1.00	2.00	2.00	0.75	0.75
Iso propyl alcohol	-	-	q.s	-	-	-	-	-	q.s	q.s

Hydroxy propyl methyl cellulose(Pharmacoat 606)	-	-	q.s	-	-	-	-	-	-	-
<b>ENTERIC COATING:</b>										
Acryl EZE Yellow (93O92157)	-	15.00	13.00	-	-	-	-	-	-	-
Eudragit L-30 D 55	-	-	-	10.26	10.26	10.26	10.26	-	-	-
Plasacrylic HTP	-	-	-	2.74	2.74	2.74	2.74			
	-	-	-	-	-	-	-	11.00	10.00	10.00
Purified Water	-	-	q.s	91	91	91	91	73.15	66.50	66.50
Isopropyl Alcohol	-	-	-	-	-	-	-	-	-	-
Dichloromethane	-	-	-	-	-	-	-	135.85	123.50	123.50
Total weight of tablet(Enteric coated)	-	160.00	160.00	160.00	160.00	160.00	160.00	160.00	160.00	160.00

#### Manufacturing Procedure of Final Batch No F9 & F10

1. Dispensing All the ingredients were dispensed accurately by using digital balance (Swiss India)
2. Geometrical Mixing and Sifting Rabeprazole Sodium was mixed with equal amount of light magnesium oxide & co-sifted through #30 sieves The above blend was co-sifted with equal amount of light magnesium oxide in geometrical progression through # 30. Sift remaining amount of light magnesium oxide, mannitol, low substituted hydroxypropyl cellulose LH 21 through #30 sieves by using vibrosifter (Elicon Pharma).
3. Dry Mixing The above sifted blends of step (i) were loaded into the rapid mixer granulator (Elicon Pharma) and mixed for 10 minutes at Impeller slow speed (50 RPM) and Chopper off.
4. Binder Preparation & Granulation: HPMC 6cps was slowly added in isopropyl alcohol and dichloromethane under stirring for 30min and poured it into the dry mix blend of step (ii) for granulation as mentioned below with intermittent racking.

Granulation steps	Time.	Impeller Speed	Chopper Speed
Binder addition.	2 min.	Slow (50 rpm)	Off
Kneading	1 min	Fast (100 rpm)	Off
Kneading	1 min.	Fast (100 rpm)	Fast (2000 rpm)

Table 2: Granulation Process

After granulation if granules not formed than further added additional solvent was added.

### Drying

Granules were dried in a Retsch drier (Retsch) till the LOD reaches 2.0 - 4.0% Checked at 105°C for 5 minutes in Moisture analyzer (Mettler Toledo). Sifting The resulting granules were passed through #24 sieves.

Blending/Mixing: The above granules were mixed with previously sifted extra granular Low substituted hydroxypropylcellulose 21 (#40 sieve) in a octagonal blender (Gansons Ltd.) for 15 min. Lubrication Pre-sifted Magnesium Stearate (#60 sieve) was added to the blend of step (VI) and mixed in octagonal blender (Gansons Ltd.) for 5 min.

### Compression

The lubricated blend was compressed in rotary compression machine (Acura) with 7.0 mm round, biconcave punches (Parle Elizabeth).

### Coating

#### Seal coating:

Light magnesium oxide was slowly added in iso propyl alcohol with continuous stirring then after few minutes ethyl cellulose was added in it then stir it continuously for 45 min. Then passed the coating solution through muslin cloth. Solid content of seal coating dispersion kept 10% w/w. Seal coating was done in auto coater (Solace).

#### Enteric coating:

Instacoat EN HPMCP yellow was slowly added in isopropyl alcohol & stirring the solution for 10 min then dichloromethane was slowly added in it and stir the solution for 45 min. Solid content of enteric coating dispersion was kept 5% w/w. Enteric coating was done in auto coater (Solace Preformulation studies: [9-11])

Parameters Seal	coating	Enteric coating
Pan Size (inches)	12	12
Solid content (%)	10	5
Inlet temperature (°C)	45°C ±5°C	45°C±5°C
Outlet temperature (°C)	35°C±5°C	35°C±5°C
Pan speed (RPM)	12	12
Peristaltic pump speed (RPM)	12	10
Inlet blower	60%	60%
Outlet blower	80%	80%
Atomizing air pressure	1Kg/cm <sup>2</sup>	1Kg/cm <sup>2</sup>

Pre-formulation investigations are designed to identify those physiochemical properties and excipient that may influence the formulation design, method of manufacture, and pharmacokinetic-biopharmaceutical properties of the resulting product.

**Bulk Density:** Bulk density is determined by constant mass method by using graduated cylinder. It is an apparent density. It is the ratio of mass of an untapped powder sample to its volume, including the contribution of the inter particulate void volume. It is expressed in a gm/ml.

$$\text{Bulk density } (\rho_B) = M/V_0$$

Where, M = mass of the blend (weight taken in gm).  
volume (volume in ml)

V<sub>0</sub>= untapped

Tapped Density:

Tapped density is the ratio of total mass of the powder to the tapped volume of the powder. When quantity of drug was taken into a graduated cylinder. Volume occupied by the drug was noted down. Then the cylinder was subjected to 500, 750, and 1250 taps in tap density apparatus

$$\text{Tapped Density ( } \rho_T) = M/V_T$$

Where,

M = Mass of the powder (weight taken in gm).

$V_T =$

Tapped volume (volume in ml)

Carr's Index (Compressibility):

The compressibility index are measures of the property of powder to be compressed. It is an indirect parameter to assume flow property of powder. Compressibility index is determined by measuring the initial volume ( $V_0$ ) and final volume ( $V_f$ ) after complete tapping of powder sample in a measuring cylinder.

$$\text{Carr's Index} = [(V_0 - V_f) / V_0] \times 100$$

Where,  $V_0$ = Initial volume (volume in ml).

$V_f$ = Final volume (volume in ml)

Hausner ratio:

It is indirect index to predict of powder flow. I is calculated by using this formula.

$$\text{Hausner ratio} = V_0 / V_f$$

Where,  $V_0$ = Initial volume (volume in ml)

$V_f$ = Final volume (volume in ml)

Angle of Repose:

The angle of repose is used to characterize the flow properties of solids. Angle of repose is a characteristic related to inter particulate friction or resistance to movement between particles. This is the maximum angle possible between surface of pile of powder or granules and the horizontal plane.

$$\begin{aligned} \tan \theta &= h/r \\ \theta &= \tan^{-1}(h/r) \end{aligned}$$

Where  $\theta$  = angle of repose

h = height

r = radius.

Drug excipient compatibility study:

The compatibility of drug and formulation component is important prerequisite before formulation. It is therefore necessary to confirm that the drug does not react with the polymers and excipients under experimental conditions and affect the shelf life of product or any other unwanted effects on the formulation.

According to the functional category these excipients were mixed in different ratios with API (Table 4). The mixture in quadruplet was sealed in ambered colored vial and was exposed for 1 month at  $40^{\circ}\text{C}\pm 2^{\circ}\text{C}/75\%\pm 5\%$  RH and  $25^{\circ}\text{C}\pm 2^{\circ}\text{C}/60\%\pm 5\%$  RH. API (rabepazole sodium) or excipients alone was also stored in similar condition as control sample. Observations for physical appearance were made after 4 weeks. The samples were also checked for related substances.

S.No.	Composition	Ratio
1	API (Rabepazole sodium)	1:1
2	API+ Mannitol.	1:1
3	API+ LHPC	1:1
4.	API+ Light magnesium oxide	1:1
5	API+ Hypromellose	1:1
6	API+ Magnesium Stearate.	1:1
7	API+ Ethyl cellulose.	1:1
8.	API+ Opadry acryl Eze	1:1
9	API+ HPMC Pthalate	1:1
10.	API: Mannitol: LHPC: Light magnesium oxide: Hypromellose: Magnesium Stearate : Ethyl cellulose : Opadry acryl Eze: HPMC Pthalate: 1.1	NA
11	All excipients without API	NA

#### Evaluation of developed tablets:

Size, shape, thickness and diameter The size and shape of the tablet can be dimensionally described, monitored and controlled. Tablet thickness is counting by using filling equipment. Some filling equipment utilizes the uniform thickness of the tablets as a counting mechanism. Ten tablets were taken, and their thickness was recorded using Vernier calipers (Precise). Uniformity of weight Weight of the tablets determined individually and collectively on a digital weighing balance, (Swiss India). The average weight of one tablet was determined from the collective weight. Individual weights of 20 tablets were taken and the average weight was calculated by using the following formula.

(Target weight of tablet – Average weight)

Weight Variation: ----- X 100

Target weight of tablet

Tablet hardness

Hardness of tablet is defined as force required breaking a table across the diameter. The hardness of tablet indicates the strength of the tablet. Hardness of the tablet of each formulation was determined using the conventional hardness tester (Monsanto Hardness tester, Pfizer hardness tester, etc.). The pressure required to break the tablets is measured

as a function of hardness (kg/ cm<sup>2</sup>). Hardness of rabeprazole sodium tablet was recorded by using strong cob (Electro lab).

#### Friability

Friability of the tablet was determined using Roche friabilator. Friability is to measure the extent of tablet breakage during physical stress conditions like Packing, transportation, etc. Friability limit is less than 1%. Friability of rabeprazole sodium tablet was recorded by using Roche friabilator (Electro lab).

(Initial weight – Final weight)

% Friability = ----- X 100

Initial weight

Disintegration time

The test was carried out by selecting 6 tablets was measured using the disintegration test apparatus. The average time required for disintegration was calculated and compared with standards. Temperature required for disintegration test is 37°C±2°C. Dissolution studies of drug product and RLD[12]Dissolution (In-Vitro release) The preferred apparatus for a tablet dosage form was paddle type (USP-II). The known quantity of 0.01N HCl & 8.0 pH tris buffer was taken as a dissolution media. The volume of dissolution media was kept 1000 mL. The dissolution was performed at 37°C±0.5°C at 100 rpm. Absorbance of sample was taken by UV spectrophotometer at 280 nm. Accelerated Stability Study:[13]The ICH guidelines have established that long term stability testing should be done at 25°C/60% RH; stress testing should be done at 40°C/75% RH for 3 months. If significant change occurs at these stress condition, then the formulation should be tested at an intermediate condition i.e. 30°C/65% RH. For stability charging used stability chamber (Thermo)

### 3.RESULTS AND DISCUSSION

From the results of Micromeritic studies of the Rabeprazole sodium it was concluded that Rabeprazole sodium has poor flow property and compressibility property. From the physical observation, no significant Drug-Excipient interaction was notified. So it was concluded that drug and other excipients were compatible with each other.

Table 05: Micromeritic properties of API

S. No.	Characteristics	Observations
1.	Description	Off white to pale yellow colored amorphous powder
2.	Tapped density.	0.714 gm/mL
3.	Bulk density.	0.400 gm/mL
4.	Carr's index.	44.00 %
5.	Hausner ratio	1.786 %
6.	Angle of repose.	44.628
7.	Solubility.	Soluble in methanol and in water

Table 06: Drug Excipients Compatibility Study (Physical Observation)

Batch . No	Initial.	Conditions and Observation	
25°C/60%RH. (4 Weeks)		40°C/75%RH (4 weeks)	
1	Rabeprazole	No color change	No color change
2.	Rabeprazole : Mannitol	No color change	No color change
3.	Rabeprazole : LHPC	No color change	No color change
4.	Rabeprazole : Light Magnesium oxide	No color change	No color change
5.	Rabeprazole : Hypromellose	No color change.	No color change
6.	Rabeprazole: Magnesium stearate	No color change	No color change
7.	Rabeprazole : Ethyl cellulose	No color change.	No color change
8.	Rabeprazole : Acryl EZE	No color change.	No color change
9.	Rabeprazole : HPMC Pthalate	No color change.	No color change
10.	Rabeprazole: Mannitol: Light magnesium oxide : LHPC :Hypermellose : Magnesium Stearate : Ethyl cellulose: Acryl Eze: HPMC Pthalate	No color change	No color change
11.	Mannitol: Light. Magnesium oxide: : LHPC Hypermellose : Magnesium Stearate : Acryl Eze: Ethyl cellulose: HPMC Pthalate	No color change.	No color change

Table 07: Lubricated blend flow property

Batch no	Bulk. density g/ml.	Tapped. density. %	Carr's. index.	Hausner's. Index	Angle of. repose	Inference
F1.	0.489±0.005	0.715±0.007	31.608±0.438.	1.462±0.010	47.74±0.618	Poor flow
F2.	0.555±0.005	0.720±0.008.	22.917±1.229	1.297±0.021	42.31±0.015.	Passable
F3.	0.512±0.004	0.680±0.005	24.705±1.147.	1.328±0.020.	41.25±0.030.	Passable
flow						
F4	0.494±0.002.	0.648±0.002	23.76±0.471	1.312±0.008	41.20±0.020	Passable
flow						
F5	0.486±0.001	0.637±0.001.	23.70±0.037	1.31±0.005	41.52±0.035.	Passable
flow						
F6.	0.588±0.005.	0.769±0.010.	23.529±0.435	1.308±0.008.	42.66±0.263.	Passable
flow						
F7.	0.577±0.009	0.768±0.004	24.870±1.246	1.331±0.023.	42.32±1.627.	Passable
flow						
F8.	0.489±0.010.	0.651±0.006.	24.885±1.358.	1.331±0.025	42.54±1.213.	Passable
F9.	0.525±0.005.	0.660±0.005	20.455±1.076.	1.257±0.017	39.10±0.251.	Fair
F10.	0.534±0.003	0.669±0.005.	20.179±0.124.	1.253±0.002	38.91±0.692.	Fair

Batch. No.	Description.	Weight. (Mg).	Thickness (MM)	Disintegration time
In 0.1N HCl In. For 2 Hrs	pH 6.8 Buffer			
F1	Weight variation observed due to poor powder flow property so compression was not done			
F2.	Yellow coloured, round, biconvex tablet.	161.2±5.977	4.22±0.077	Fail ND
F3	Yellow coloured, round, biconvex tablet.	164.6±2.836.	4.29±0.034.	Pass 17 min 20 sec
F4.	White coloured, round, Biconvex tablet.	163.1±4.12	3.91±0.134	Pass. 8 min 10 sec to 11 min 32 sec
F5.	White coloured, round, Biconvex tablet.	162.1±1.663.	4.18±0.052n.	Pass 7 min 30 sec to 8 min 42 sec
F6.	White coloured, round, tablet.	160.4±2.118	4.37±0.051.	Pass 8 min 22 sec to 10 min 38 sec
F7.	White coloured, round, biconvex tablet.	163.6±3.717	4.20±0.385	Pass 8 min 20 to 14 min 40 sec
F8.	Yellow coloured, round biconvex tablet.	160.2±3.259	4.09±0.034.	Pass 4 min 20 sec to 6 min 50 sec
F9.	Yellow coloured, round, Biconvex tablet.	159.1±2.233	4.00±0.056	Pass. 3 min 50 sec- 5 min 20 sec
F10	Yellow coloured, round, tablet.	159.1±0.994.	4.08±0.080.	Pass 4 min 10sec . biconvex -6 min 50 sec

Table 08: Parameters of enteric coated tablet: (In process tablet parameters)

Table 09: Drug content (Assay) of Trial Batches

Acceptance Limit	F1	F2	F3	F4.	F5	F6	F7	F8	F9	F10
Assay 95.0% to 105.0%	ND.	ND	99.1	100.3	98.7	101.5	99.3	98.9	100.6	99.2

In-Vitro Dissolution Profile between RLD and Trail Batches with F2:

Table 9a: Dissolution of trial batches in 0.1N HCl

% Release. in 0.1N HCl, 700ML	Time	Acceptance Limit %	RLD. (Pariet20)	F1	F2.	F3	F4.	F5.	F6	F7	F8.	F9.	F10
2Hrs.	NMT 10%	1.2	Not	Not.	15	1.5.	2.0	1.8	1.1.	0.8.	0.6	0.8	

F1: Not done due to physical parameters were not satisfactory

F2: Not done due to tablet became black during seal coating and also failed in DT

Table 9b: Dissolution of trial batches in Tris buffer (pH 8.0)

% Release in OGD media (pH 8.0 Tris Buffer)	Time.	RLD. (Pariet®20)	F1	F2	F3.	F4	F5.	F6	F7.	F8.	F9.	F10
0	0	Not. done	Not. done	. Not. done	0	0	0	0	0	0	0	0
5.	0.				70	92	94	0	6	0.9.	2	
10	50.00				97.	99.	80.	63	38	54.	57	
15.	98.90				96	99	92	87	89.	92	89	
20.	99.20				94	98	93	90.	93.	96	97	
30.	96.60				89	95	91	90	90	97.	98	
45	93.90				88.	91	87	87	87	89	92	
60	88.70				85.	87.	84	84.	81.	87	86	
F2.					20.4.	20.0	45.1	52.7	55.1.	68.5.	65.2	

F1: Dissolution was not done due to physical parameters were not satisfactory

F2: Dissolution was not done due to tablet became black during seal coating and also failed in DT At 0.1N HCl media.

F3: Dissolution in pH 8.0 Tris buffer was not done due to tablets failed in 0.1N HCl media during Dissolution results was already showed in table no:

Dissolution graph of RLD Pariet 20mg with final formulation F9 and its reproducible batch F9:

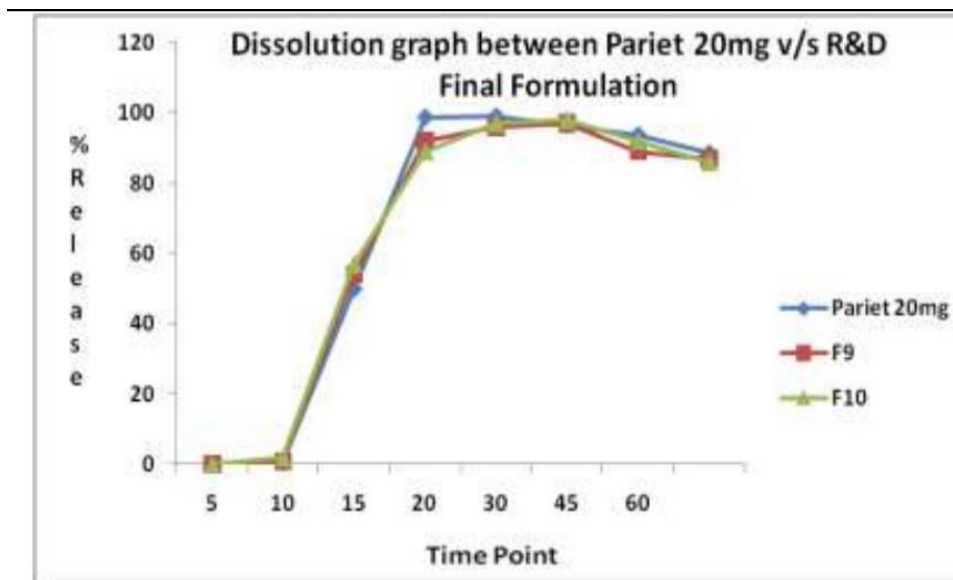


Figure 1: Dissolution between Pariet 20mg v/s Final Formulation F9 and F10

Stability Data of Selected Formulation:

Stability studies were conducted at 40°C/75% RH for about 3 months in stability chamber (thermo lab). Samples were collected at 1,2 and 3 months.

Table 10: Stability data

Time	Test (%)	Temperature 40°C / 75% RH
Initial.	Assay	11.72
	Acid resistance.	99.75
	% DR	86.24
	Assay	11.6
1 month.	Acid resistance	99.10
	% DR	85.80
	Assay	11.5
2 month	Acid resistance	98.6
	% DR	85.0
	Assay.	11.5
3 month	Acid resistance.	97.9
	% DR.	84

#### 4. SUMMARY AND CONCLUSION

Attempt was made to prepare a delayed release formulation of rabeprazole as enteric coated Tablets. The core tablet consists of rabeprazole sodium (21.07mg), mannitol (36mg), light Magnesium oxide (68.93), L-Hydroxypropylcellulose(15mg), Hypromellose (2mg) and magnesium Stearate (2mg).The core tablets were given a sub coating with ethyl cellulose and magnesium oxide (2.75%w/w).An enteric coating was then given with HPMC phthalate (7.38%w/w). The release Profile of enteric coated formulation (F9) was comparable to that obtained with innovator product

i.e. Pariet20mg. These results clearly reflect that the prepared formulation offers effective resistance to acidic environment and starts drug release at the elevated pH of intestine. The developed delayed release tablet formulation was quite stable with regard to drug content and dissolution in the accelerated stability testing condition for 3 months.

#### REFERENCES:

1. Bramankar DM and Jaiswal SB. Biopharmaceutics and Pharmacokinetics: A Treatise. Vallabh prakashan; Delhi;1995. p.335-337.
2. Vyas SP and Khar RK. Controlled drug delivery system: Concepts and advances. Vallabh Prakashan; New Delhi; 2002. p.167.
3. Lachman L, Lieberman HA, Kaing JL. The Theory and Practice of Industrial Pharmacy. 3rd, Bombay.
4. Gennrao RA. Controlled release drug delivery system: The science and Practice of pharmacy, Remington; 20th ed, vol 1; p.903-930.
5. Ijeoma FU, Andreas GS. Polymers in Drug Delivery. 1st ed; 2006.p 235  
Gupta et. Al., Am. J. PharmTech Res. 2020; 10(01) ISSN: 2249-3387
6. Sanjiv A, Deepak K.A, Mahesh K., Om P. Correlation studies between dissolution and Thermal rate constants of rabeprazole sodium drug and their tablets. Der Pharmacia Lettre. 2011; 3(3): 272-279.
7. Jain R., Jindal C, Singh S. Pharmaceutical composition comprising of proton pump Inhibitor and prokinetic agent. U.S. patent No 2007/0160664A1; 2007.
8. Dietrich Ney R. Oral administration form for pyridine-2-methyl sulfinyl-1Hbenzimidazoles. U.S patent No. US 7041313 B1; 2006.
9. Cooper J, Gun C. Tutorial Pharmacy. 12<sup>th</sup> edition CBS publication and distributors, New Delhi;1986; 211-233.
10. Aulton M.E., Pharmaceutics: The Science of Dosage form design 2<sup>nd</sup> edition, Churchill Livingstone, England; 2002; 247.
11. Martin A. Physical pharmacy and pharmaceutical sciences .5<sup>th</sup> edition, New York Lippincott Williams and Wilkins; 2001; 423-454.
12. Indian Pharmacopoeia. The Controller of Publications, Ministry of Health and Family Welfare, Government of India, New Delhi, 1996, A-80, 2.
13. ICH, Accelerated stability testing of new drug substances and products, Geneva. International conference on Harmonization, Nov 1996.