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Formulation & Evaluation of Effervescent tablets and its Comparison with the Marketed Preparation

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ABSTRACT: The most popular pharmaceutical delivery technique is oral dosage forms, although there are significant drawbacks compared to other delivery systems, such as the risk of drug absorption, which can be avoided by giving the medication in a liquid form, possibly allowing for the use of low doses. The goal of this study was to formulate effervescent tablets with adequate mechanical integrity and quick water dissolution and for patient compliance.Effervescent tablets are uncoated tablets that typically contain carbonates or bicarbonates and acids. They react quickly with water to release carbon dioxide. Before use, they are supposed to dissolve or disperse in water. We have formulated Aspirin Tablets by using different concentration of excipients in differentA1, A2, A3 and A4 batches. As per the results obtained, it was found that the formulation batch No A4 was found to be similar with the marketed Preparation with special reference to dispersion time. Formulation batch No A1 was found to be having dispersion time very less in comparison with the marketed preparations and which was found to be very beneficial to patient as it disperses rapidly and gives faster effect as compared to marketed tablet.

Keywords: Patient compliance, oral route, effervescent tablet, mechanical integrity

I. INTRODUCTION:

The oral route is the most desired mode of medication delivery; however, it may have certain unfavourable effects, such as a gradual onset of action or a gradual absorption over time. Other dose forms and drug delivery methods can be used to solve this issue.[1]. Certain factors, such as the longevity and accessibility of the formulations and active pharmaceutical ingredients, should be taken into account while choosing the dosage form or the method of drug administration. Due to how convenient they are to take, effervescent pills are becoming more and more common in a number of industries, including supplements and pharmaceutical use. Effervescent pills are made to dissolve into a solution when they come into touch with liquids like juice or water.[2].

Effervescence is the term for the CO2 gas emission caused by the reaction of acids and bicarbonates with water. Citric, malic, tartaric, adipic, and fumaric acids are other frequent acids employed in this reaction. Sodium, potassium, sodium carbonate, and potassium bicarbonate are the bicarbonates utilised in the effervescent reaction. The acid-base interaction between sodium bicarbonate and citric acid is the most frequent medication reaction for medicinal usage. [3-4].

$3Na_3C_6H_5O_7$ (aq) + $3H_2O$ + $3CO_2$ = $3NaHCO_3$ (aq) + $H_3C_6H_5O_7$ (aq)

When water is present to catalyse the reaction, even in little amounts, the reaction proceeds more quickly. All goods that are moisture-sensitive or effervescent are stored in a moisture-free environment since water serves as a catalyst for the reaction.

The pills known as effervescent or carbon tablets are made to dissolve in liquid and release carbon dioxide [3]. It is made from compressed materials in powder form that solidify into a

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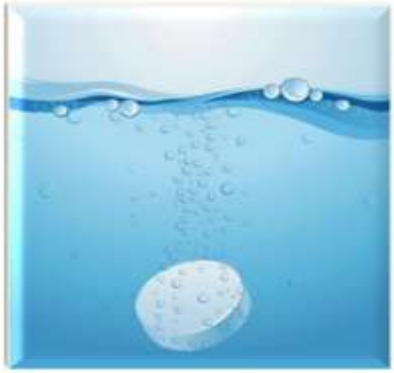

Figure 1: Effervescence of Tablet

thick mass, which is then wrapped in a blister pack or a packet filled with petrol and sealed with a desiccant. They must be blended with water to create a solution before using. ingredients in powder form can either be packaged and sold as effervescent powders or granulated and sold as effervescent granules. Before making the tablets, the powdered materials are frequently first granulated.[5].

Effervescent aspirin tablets are a well-liked and practical medicine formulation that provides an immediate and efficient method of pain relief and inflammation reduction. These tablets are created to dissolve in water and produce a bubbly, quickly acting solution that is simple to consume. The nonsteroidal anti-inflammatory medicine (NSAID) aspirin, often referred to as acetylsalicylic acid, is a popular NSAID that has been used for many years to treat pain, lower fever, and prevent blood clots. Due to its quick start of action, simplicity of administration, and tasty taste, effervescent tablets are a widely used aspirin form. The pros and cons of aspirin effervescent pills, its mode of action, and any risks or adverse effects.[6].

Figure 2: Effervescent tablet dissolving in a water.

For those who need quick and efficient relief from mild to moderate pain or inflammation, effervescent aspirin tablets are a popular option. In order to accelerate the rate at which the medication enters the bloodstream, these tablets work by quickly dissolving in water and producing carbon dioxide bubbles. As a result, the medication reaches the site of action and produce fast action thereby relieving pain and inflammation. Easy use is one of the key benefits of aspirin effervescent tablets. These tablets can bedissolved in water, making them easier to take,especially for those who have swallowing issues, as opposed to conventional tablets or capsules, which may be challengingfor certain people to swallow. In addition, effervescent aspirin tablets come in avariety of flavours, such lemon or orange, making them a more appealing choice for folks who don't enjoy the taste of conventional tablets [7].

Effervescent pills have a number of benefits over conventional tablets, including:

1.Faster absorption: Compared to conventional tablets, the medication is absorbed more quickly into the bloodstream when the pill dissolves in water.

2.Simpler to take: Traditional tablets can be challenging for some people to swallow, especially if they are large or have a disagreeable flavour. Water can be used to dissolve effervescent tablets, which helps to make them easier to swallow and can help to cover up any unappealing flavour.

3.Accurate Dosing: The pre-dosing of effervescent pills can help to ensure that you are taking the right dosage of medication.

These days, mild to severe discomfort, such as headaches, menstrual cramps, and toothaches, is frequently treated with aspirin effervescent pills. They may also be applied to lessen fever and inflammation brought on by ailments like arthritis.

Investigating the impact of various excipients on the stability and dissolving of aspirin effervescent tablets is the issue being investigated in this study.

The following are the research's aims:

1.to ascertain how various excipients affect how quickly aspirin effervescent tablets dissolve.

2.to look at how different excipients affect the aspirin effervescent tablet's long-term stability.

3.to determine which excipients can make aspirin effervescent pills more stable and better at dissolving.

International Journal of Pharmaceutical Research and Applications
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4.to maximise stability and dissolution by modifying the aspirin effervescent tablet formulation using the identified excipients.

By attaining these goals, the study will advance knowledge of the variables affecting aspirin effervescent tablet performance and offer insightful information for the creation of more reliable and efficient formulations[8].

A fizzy or effervescent effect is produced by effervescent tablets, which are made to dissolve fast in water and release carbon dioxide gas. They are frequently employed to make a hydrating beverage, provide vitamins, minerals, or prescription drugs. Effervescent tablet varieties include the following:

1.Pills with high amounts of vitamin C:an essential antioxidant that promotes immunological health, are known as "vitamin C effervescent tablets."
2.Effervescent multivitamin tablets: These tablets include a range of vitamins and minerals to help with general health and wellbeing.
3.Electrolyte effervescent pills: These tablets include electrolytes, such as sodium, potassium, and magnesium, which are crucial for hydration and maintaining the body's normal fluid balance.
4.Effervescent antacid tablets: These tablets contain chemicals like calcium carbonate or sodium bicarbonate, which assist neutralise stomach acid and ease indigestion or heartburn symptoms.
5.Effervescent tablets for pain relief: These pills are frequently used to treat headaches and other types of pain since they contain pain-relieving substances like aspirin or ibuprofen.
6.Energy effervescent tablets: These pills have caffeine and other substances that are intended to give you a rapid energy boost.

II. 2. REVIEW OF LITERATURE

The Review of Literature was carried out from differentTextBooks, Reference Books, Journals, Internet etc.

1. Hebbal and colleagues'et al/ Journal of Pharmacy Research 2012; 5(10), 5327-5329[9].

They reviewd that the impact of several excipients, such as sodium bicarbonate, citric acid, and tartaric acid, on the pace at which aspirin effervescent tablets dissolve.

2. Nounou and colleagueset al / Journal of Excipients and Food Chemicals 2014; 2(5), 122-124[10].

They reviewed that the effect of several excipients, such as sorbitol, lactose, and mannitol, on the stability of aspirin effervescent tablets over time was the subject of another study

3. R. Akram et al. / Journal of Pharmaceutical Sciences and Research in 2012; 4(1), 969-974[11].

They reviewed that the Comparative bioavailability of two effervescent formulations of aspirin in healthy volunteers.

4. L. Liu et al./ in the Journal of Clinical Pharmacy and Therapeutics in 2013; 38(1), 49-54[12].

They reviewed that comparison of enteric-coated tablets, the aspirin effervescent tablet formulation had a quicker onset of action and was more effective at reducing fever and pain.

5. N. Sheikh, et al.'/Journal of Pharmacy and Pharmacology 2015; 67(1), 81-88[13].

They reviewed that study of Evaluation of aspirin effervescent tablet formulation for the management of acute pain.

6. S. Ganguly et al.'/The International Journal of Pharmaceutical Sciences and Research article 2017; 54(4), 31-36[14].

They reviewed that the study of Evaluation of an aspirin effervescent tablet formulation for the treatment of migraine.

III. AIM,OBJECTIVES AND NEED OF RESEARCH

Aim: "Formulation& Evaluation of Effervescent tablets and its Comparison with the Marketed Preparation"

Objectives:

1. To make Effervescent Tablets in such way that it may dispersewithin fraction of seconds.
2. To make the tablet in such a way that it enhances the patient compliance.

Need of Research: -

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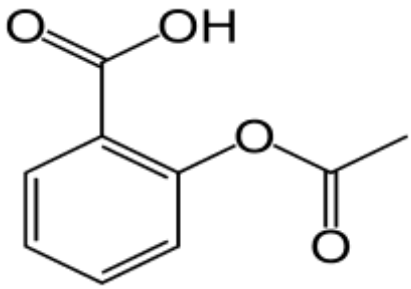
Generally marketed preparation takes at least 1min to disperse. But our work focuses on to formulate Effervescent Tablets in such way that it may disperse within fraction of seconds thereby increasing patient compliance. The harsh taste of aspirin is covered up by the tablet's effervescence, which may increase patient compliance. Acute discomfort or fever can be effectively treated with this tablet due to its quick dissolving and potential for a quicker commencement of action.

Studies are required to examine the potential uses of aspirin effervescent pills in the treatment of fever, migraine headaches, and acute pain.

To increase the efficacy, safety, and acceptability of aspirin effervescent tablets among patients, formulation improvements can be made. Research is required to compare the effectiveness and safety of aspirin effervescent tablets to other aspirin dosage forms, such as conventional tablets or capsules.

IV. DRUGS AND EXCIPIENT PROFILE:

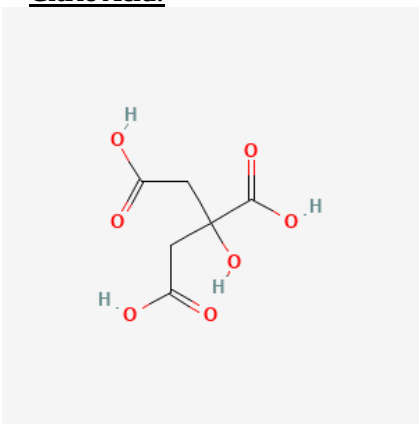
3.1 Aspirin:



IUPAC NAME: 2-acetyloxybenzoic acid
Molecular formula: $C_9H_8O_4$
Molecular Weight: 180.16 g/mol

Melting Point: 136^0C
Boiling Point: 140^0C
Density: 1.4 g/cm^3
Solubility: Aspirin is soluble in organic solvents such ethanol, methanol, acetone, and chloroform but is only marginally soluble in water, as was previously indicated.
Physical properties:Aspirin is available as tablets or a white crystalline powder, odourless, with a pH of 3-4. It has a monoclinic crystal structure and lacks optical activity. Aspirin is hygroscopic, which may affect its stability.
Uses: Pain relief Reducing fever
Anti-inflammation
Blood thinning to prevent heart attacks and strokes.
Plasma Protein Binding:90-95%and a short half-life.
Pharmacokinetic: The Pharmacokinetics of aspirin involve its rapid absorption in the stomach and small intestine, extensive distribution throughout the body (including the brain and placenta), hepatic metabolism into salicylic acid, and renal elimination. Aspirin's elimination half-life ranges from 2 to 4 hours, and it is primarily excreted through the kidneys. Individual factors, dose, drug interactions, and underlying conditions can influence its pharmacokinetics.[15-16].

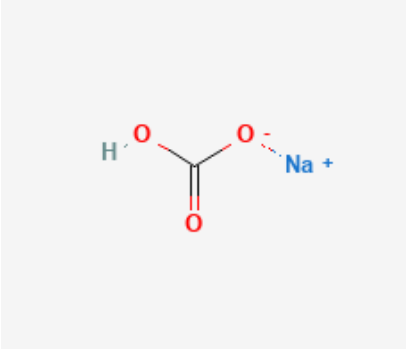
3.2 Citric Acid:



IUPAC NAME: 2-hydroxypropane-1,2,3-tricarboxylic acid.
Molecular formula: $C_6H_8O_7$
Molecular Weight: 192.124g/mol
0
Melting Point: 153^0C
Boiling Point: 310^0C
Density: 1.66 g/cm^3
Solubility:soluble in Water (1174g/L at 10°C, 1809g/L at 30°C, 3825g/L at 80°C).
Citric acid also dissolves in absolute (anhydrous) ethanol (76 parts of citric acid per 100 parts of ethanol) at 15 °C.
Physical properties: Citric acid is a white crystalline powder with a tart taste and no distinct odour.Citric acid is classified as a weak organic acid and is commonly used as a food additive for flavouring, as a preservative, and for various other industrial and pharmaceutical applications.[17-18].
Uses: As a food additive cleaning products personal care items
Pharmaceutical application
Industrial applications

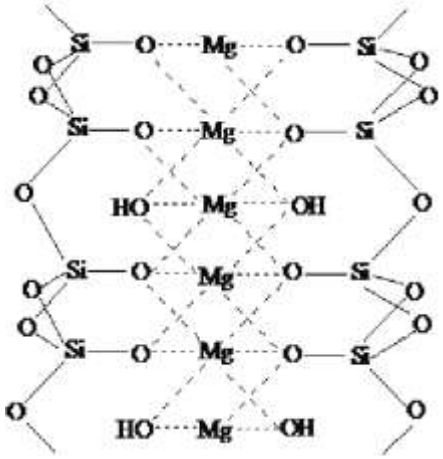
International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 3 May-June 2023, pp: 3209-3224 www.ijprajournal.com ISSN: 2249-7781

3.3 Sodium Bicarbonate:



IUPAC NAME: sodium; hydrogen carbonate
Molecular formula: $NaHCO_3$
Molecular Weight: 87.007g/mol
0
Melting Point: 50^0C
Boiling Point: 851^0C
Density: 2.20g/cm^3
Solubility:Sodium bicarbonate is moderately soluble in water, with around 9 grams dissolving in 100 millilitres of water at room temperature. Solubility increases with higher temperatures.
Physical properties: Sodium bicarbonate is a white, crystalline solid with a fine powder texture. It is odorless and has a slightly salty taste[19-20].
Uses:
Baking
Cooking
Household cleaning
Personal care
Medical application

3.4 Talc



IUPAC Name :- trimagnesium;dioxido(oxo)silane;hydroxy-oxido-oxosilane
Molecular Formula :-$H_2Mg_3O_{12}Si_4$
Molecular Weight :- 379.27g/mol
Melting Point :- 1500°C
Boiling Point :- 9002.6- 2.8°C
Density :- 2.6- 2.8 g/cm³
Physical Properties :- Appearance -Whitish grey to green with a vitreous and pearly luster
Solubility :-Insoluble in water and slightly soluble in dilute mineral acids[21]
Uses :-Used to absorb moisture
Prevent caking
Improve consistency
To make a product opaque.

V. PLAN OF WORK

STEP: I
Collection of main ingredientsand materials from laboratoryof NCP:
1. Aspirin, citric acid
2. sodium bicarbonate
3. and any additional flavours or sweeteners are required for an aspirin effervescent tablet.

STEP: II
Ingredient weighing and blending: To ensure equitable distribution, the ingredients should be precisely weighed before being combined in a mixer or blender.

STEP: III
Compress the tablet: Using a tablet press, the powder combination should be compacted into tablets.

STEP: IV
Evaluation of Pre-Compression Characteristics ofPowderlike Bulk Density, TappedDensity, Angle of Repose,Hausner's Ratio

STEP V
Evaluation of the tablets for parameters likeWeightVariation,Hardness, % Friability, Thickness .

STEP VI
Evaluation of tablet for parameterslikeWetting time, Wetting volume, Uniformity of Dispersion, Content of Active Ingredients, Water absorption Ratio, Dispersion Time,Disintegration Time

STEP: VII
Storage of the tablet: To study their stability and effectiveness, the final formulated tablets should be kept in a dry, cool location away from moisture, heat, and direct sunlight.

STEP VIII
Comparison with Marketed tablet

International Journal of Pharmaceutical Research and Applications
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VI. MATERIAL & METHODS:

Table 1: List of chemicals used in the study

Sr. No	Chemicals	Produced from
1	Aspirin	**CLAIROFIT INDIA**
2	Citric acid anhydrous	**LOBA CHEMIE PVT. LTD.**
3	Sodium bicarbonate	**SAMAR CHEMICALS**

Aspirin (acetylsalicylic acid) is the active ingredient of aspirin effervescent tablets and the tablets also contain excipients such citric acid and sodium bicarbonate etc
All other chemicals used in the study were of ARgrade.

Table 2: List of instruments used in the study

Sr. No	Instrument used	Make
1	Weighing Balance	**WENSAR**
2	Tablet Compression Machine	**MASTECHMACHINERY**
3	Roche Friability Tester	**SYDTONIC**
4	Hardness Tester	**MONSANTO**

VII. RESULT AND DISCUSSION

7.1 Pre formulation study of Aspirin Drug [22]

Table 3: Pre formulation study of Aspirin drug [22]

Sr. No	Parameter	Results(specification)
1	Appearance	Crystalline powder
2	Color	White to off-white
3	Odor	Characteristic
4	Taste	Very Bitter
5	Malting Point	136 **°C**

7.2 Methods of Preparation:

Preparation of tablets by Direct Compression Method: -

Procedure: -

All the ingredients were weighed accurately and mixed thoroughly. Tablets were prepared by Direct Compression Method. This method can be defined as basically mixing and processing of formulation ingredients then compressing into tablets. The tablets were obtained directly from the powder and other excipients.

International Journal of Pharmaceutical Research and Applications
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Formulation

Table 4: Composition of Effervescent Tablets of Aspirin corresponding formulations. (Each tablet =600 mg)

Formulation on Code Batches	Aspirin (in mg)	Sodium Bicarbonate (in mg)	Citric acid (in mg)	Talc (in mg)
A1	325	110	155	10
A2	325	122	143	10
A3	325	135	130	10
A4	325	140	125	10

7.3Pre-compression characteristics of tablet

Pre-compression characteristics of tablet like Bulk density, Tapped density, Angle of Repose, Hausner's ratio , Carr's Compressibility Index by using standard procedures.

1. Angle of repose (θ):

The greatest angle that may be formed between a pile of powder's surface and a horizontal plane is known as the angle of repose. The angle of repose is a useful tool for calculating the frictional force in loose powder or granules. [23] It is a sign of the powder's flow characteristics.

$$\tan \theta = H / R$$

$$\theta = \tan^{-1} (H/R)$$

Where, θ is the angle of repose
H is height of pile
R is radius of the base of pile

The funnel was set up on a stand at a specific height (H), and the powder mixture was allowed to flow through it. The angle of repose was then determined by taking measurements of the height and radius of the powder pile that had formed. Care was taken to ensure that the powder particles rolled and slipped through the funnel's sides. Angle of repose and powder flow characteristics are related.[24]

Table 5: Angle of repose as an indication of powder flow properties

Angle of repose (degrees)	Type of flow
<20	Excellent
20-30	Good
30-34	Passable
>34	Very poor

2. Flow Rate:

The rate at which a specific mass exits a funnel with the appropriate diameter is referred to as the flow rate of a powder.[25]. By carefully measuring out portions of each formulation's granules and putting them into a funnel with an 8 mm aperture, the flow rate of the granules was calculated. A stopwatch was used to time how long it took for the entire granule mass to emerge from the aperture.[26] The following equation was used to compute the flow rate:

$$\text{Flow Rate} = \frac{\text{Weight of granules}}{\text{Time in seconds}}$$

3. Bulk Density:

By dividing the mass of a powder by the bulk volume in cm^3, the bulk density was calculated. The sample of around 50 cm^3 of powder, which had previously been put through a standard sieve no. 20, was carefully added to a graduated cylinder with a capacity of 100 ml. At 2-second intervals, the cylinder was dropped three times from a height of 1 inch onto a hard wood surface. The bulk density of each formulation was then calculated by dividing the sample's weight in grams by the cylinder's final sample volume in cm^3[27] It was determined using the following equation:

$$Df = M/Vp$$

Where,
Df = bulk density
M = weight of samples in grams
Vp = final volumes of granules in cm3

International Journal of Pharmaceutical Research and Applications
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4. Tapped density:

By dividing the mass of a powder by the tapped volume in cm^3, the tapped density was calculated. A sample of powder that measures 50 cm^3 and has previously been put through a standard sieve no[28] 20 is carefully poured into a graduated cylinder with a capacity of 100 ml. 100 times from a height of 1 inch; the cylinder was dropped at 2-second intervals onto a firm wood surface. The tapped density of each formulation was then calculated by dividing the sample's weight in grams by its final tapped volume in cubic centimetres (cm^3)[29]It was determined using the following equation:

$$D_o = M/V_p$$

Where

D_o= bulk density

M = weight of samples in grams

V_p = final volumes of granules in cm^3

5. Carr's Index:

Carr created a method for estimating powder flow indirectly from bulk densities. The strength and stability of a powdered arch or bridge might be directly determined by the percentage of compressibility of the powder[30] Each formulation's Carr's index was computed using the following equation:

$$\% \text{ compressibility} = \frac{Df - Do}{Df} X\ 100$$

Where,

D_f = Fluff or Poured bulk or bulk density.

D_o = Tapped or Consolidated bulk density.

Table 6: Carr's Index an indication of powder flow

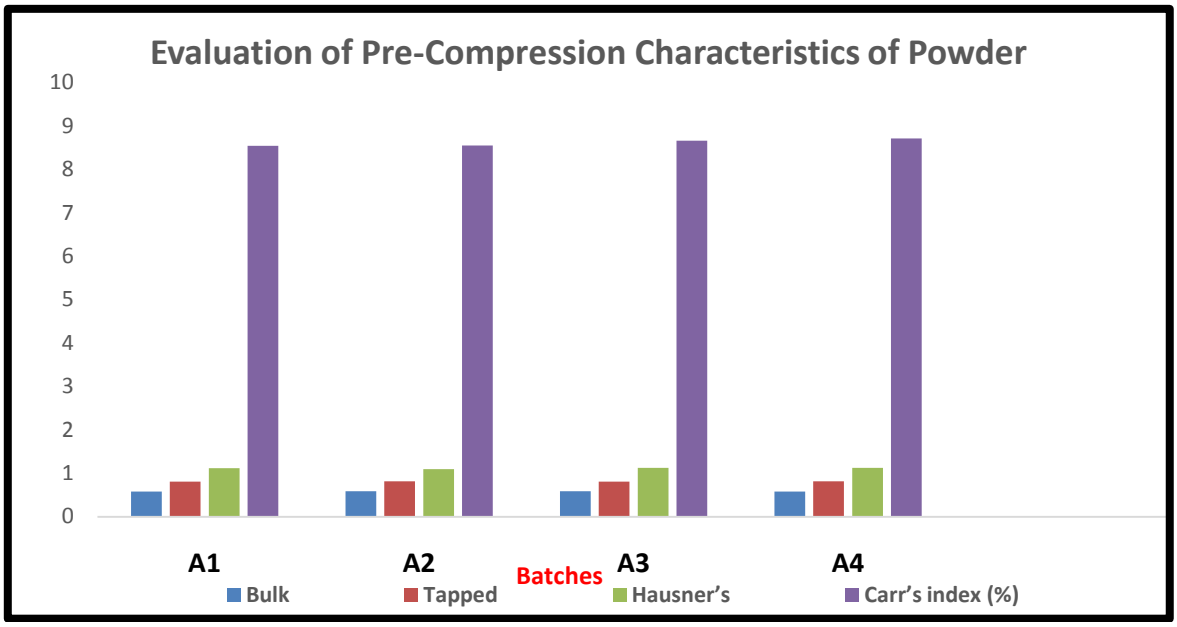
Carr's index (%)	Type of flow
5-15	Excellent
12-16	Good
18-21	Fair to passable
23-35	Poor
33-38	Very poor
>40	Extremely poor

Table No 7:Evaluation of Pre-Compression Characteristics of Powder

Formulation Code	Bulk Density (g/cm3)	Tapped Density (g/cm3)	Angle of Repose(θ°)	Hausner's Ratio	Carr's index (%)
A1	0.58	0.81	26.69	1.12	8.55
A2	0.59	0.82	25.24	1.10	8.56
A3	0.59	0.81	26.60	1.13	8.67
A4	0.58	0.82	25.20	1.13	8.72

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 3 May-June 2023, pp: 3209-3224 www.ijprajournal.com ISSN: 2249-7781

Graph No 1: Evaluation of Pre-Compression Characteristics of Powder



7.4Evaluation parameter of tablet: -

The tablets from all the batches were evaluated for different parameters as follows:

1.Appearance: -

Tablets were evaluated for organoleptic properties.

1) The general appearance of a tablet, its identity, and general elegance is essential for consumer acceptance, for tablet-to-tablet uniformity.
2) The control of general appearance involves the measurement of size, shape, color, presence or absence of odor, taste, etc.

2.Thickness ;-

Thickness of tablets was determined using Vernier calliper, three tablets from each batch were used and an average value was calculated in terms of (mm)[31-32].

3.Weight Variation :-

Twenty tablets were selected and average weight was determined. Then individual tablets were weighed and the individual weight was compared with an average weight.

Formula for Weight Variation of Tablets:-

Average weight of 20 tablets was calculated using the formula:

$$\text{mean} = \frac{(X1 + X2 + X3 \ \ldots \ + X20)}{20}$$

Percentage deviation of Weight Variation

$$= \frac{\left(\begin{array}{c}\text{Individual tablet} \\ \text{weight}\end{array} - \begin{array}{c}\text{Average weight of} \\ \text{20 tablets}\end{array}\right)}{\begin{array}{c}\text{Average weight} \\ \text{of 20 tablets}\end{array}} \times 100$$

4.Hardness **:-**

Tablets were selected at random from each formulation and hardness was checked using Monsanto Hardness Tester. The hardness was measured in terms of kg/cm2 . Triplicate readings were taken and average was determined[33-34].

5.Friability test:-

Roche friabilator was used for testing the friability of the tablets. For this test, 20 tablets were weighted accurately and placed in the friabilator chamber and rotated at 25rpm for a period of 4 min. Tablets were again weighted and the percentage weight loss was determining by using formula given by,

% Friability = [(W1-W2)100]/W1

Where,

W_1= Weight of tablet before test

W_2 = Weight of tablet after test

6.Content of Active Ingredient**:-**

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Volume 8, Issue 3 May-June 2023, pp: 3209-3224 www.ijprajournal.com ISSN: 2249-7781

Drug content of all the batches was determined. For this purpose six tablets were weighed and crushed with pestle in a small glass mortar. The fine powder was weighed to get 200 mg (equivalent to 60 mg of Aspirin), and transferred to 250 ml conical flask containing 100 ml of Distilled water stirred for 45 min in ultra sonicator[35]. Solution was filtered and the filtrates obtained were analyzed UV spectrophotometrically and drug content was determined[36].

7.Uniformity of Weight :-

Uniformity of weight is an in-process test parameter which ensures consistency of dosage units during compression. 20 Tablets were selected at random and weighed individually and the average weight was calculated.

8.Wetting Time :-

A piece of tissue paper folded twice was placed in a small Petri dish containing 6 ml of purified water, then a tablet was placed on the paper and the time required for complete wetting was measured. Wetting time corresponds to the time taken for the tablet to disintegrate when placed gently on the tissue paper in a Petridish. Less wetting time indicates more porous tablets[37].

9.Wetting Volume :-

The tablet was placed in the center of the Petri dish and with the help of 5 ml pipette distilled water was added drop wise on the tablet. The volume required to completely disintegrate the tablet was noted as the wetting volume.

10.Water Absorption Ratio :-

A piece of tissue paper folded twice was placed in a small Petri dish (10 cm diameter) containing 6 ml of water. A tablet was put on the tissue paper and allowed to wet completely. The wetted tablet was then reweighed. Water absorption ratio, R was determined using following equation,

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

Where;
Wa= weight of tablet after water absorption
Wb= weight of tablet before water absorption.

11.Dispersion Time :-

Tablet was added to 10 ml of water and time required for complete dispersion was measured. Three tablets from each formulation were randomly selected and Dispersion time was performed[38].

12.Disintegration Time :-

The disintegration time of tablet was measured in water (37^0C) according to USP Disintegration test apparatus. Three trials for each batch were performed.

13.Solubility analysis :-

A semi quantitative determination of the solubility was made by adding solvent in small amount to a test tube containing fixed quantity of solute or vice versa. Aspirin is freely soluble in ethanol(95 %),soluble in chloroform and ether and slightly soluble in water[39-41].

Table No.8 (a) :- Evaluation Parameters of tablet

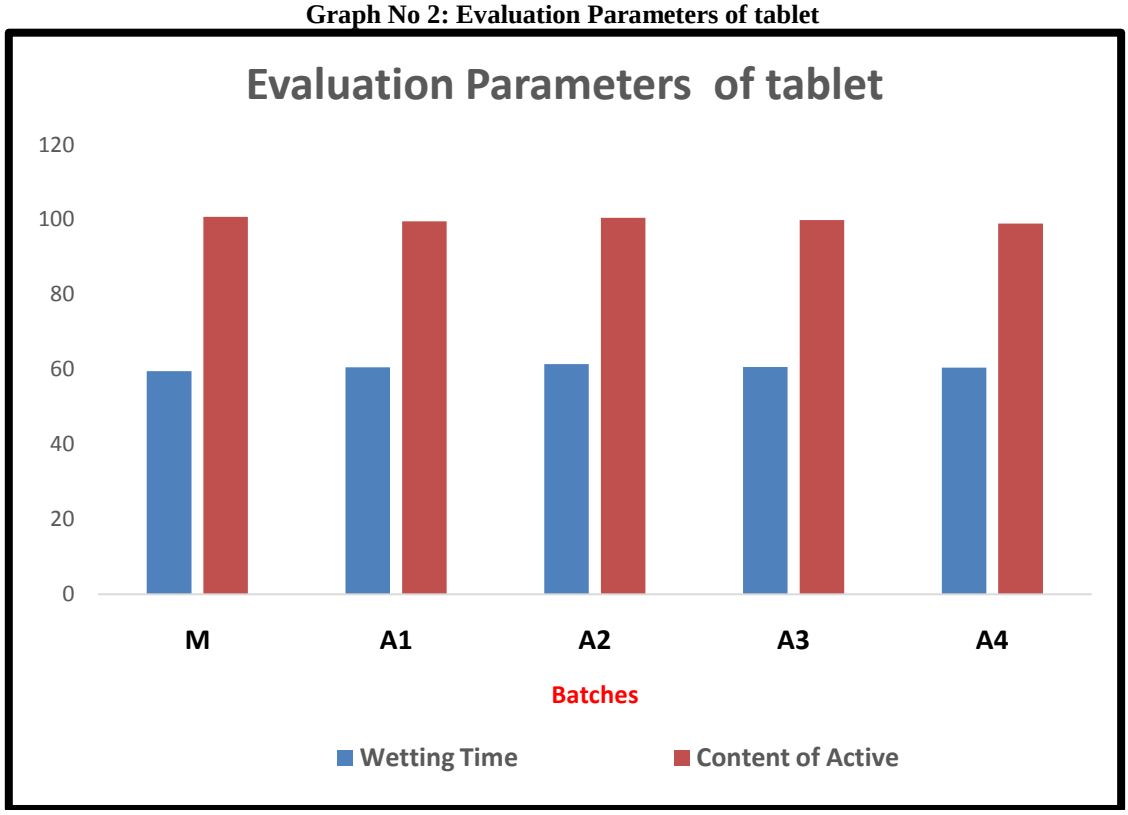
Formulation Code	Weight Variation* (mg)	Hardness* (kg/cm^2)	%Friability*	Thickness* (mm)
M	401.1	6.2	0.10	4.20
A1	600.2	5.7	0.09	5.95
A2	602.3	5.8	0.97	5.94
A3	605.6	6.0	0.10	5.96
A4	604.2	5.9	0.10	6.03

International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 3 May-June 2023, pp: 3209-3224 www.ijprajournal.com ISSN: 2249-7781

Formulation Code	Wetting Time (sec)	Wetting Volume (ml)	Uniformity of Dispersion	Content of Active Ingredients %
M	59.55	5.19	Passes	100.78
A1	60.56	5.18	Passes	99.56
A2	61.45	5.76	Passes	100.48
A3	60.65	5.56	Passes	99.91
A4	60.52	5.46	Passes	98.94

Table No.8 (b):- Evaluation Parameters of tablet

Graph No 2: Evaluation Parameters of tablet



International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 3 May-June 2023, pp: 3209-3224 www.ijprajournal.com ISSN: 2249-7781

Graph No 3: Graph of Wetting volume

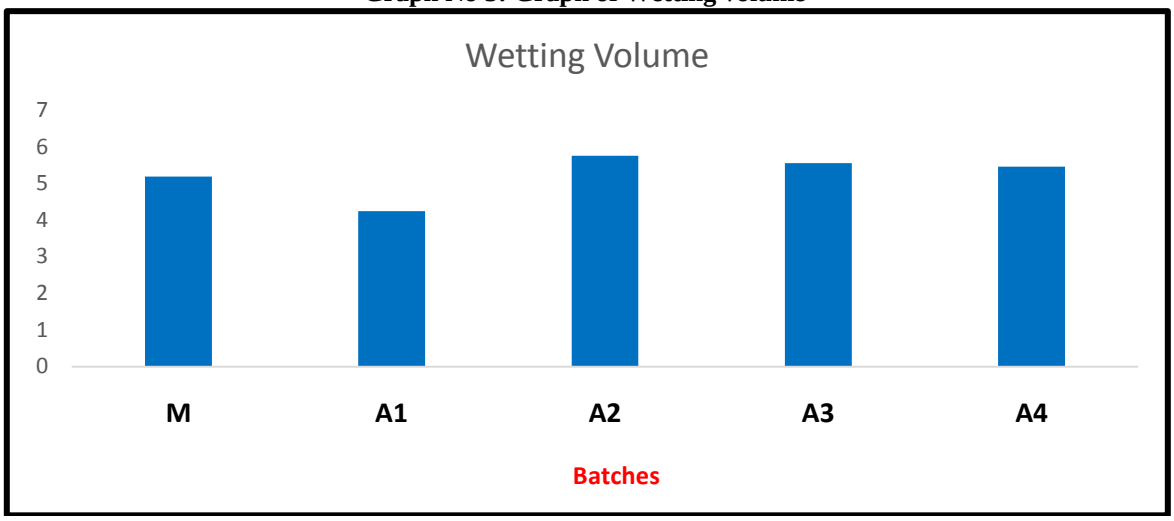
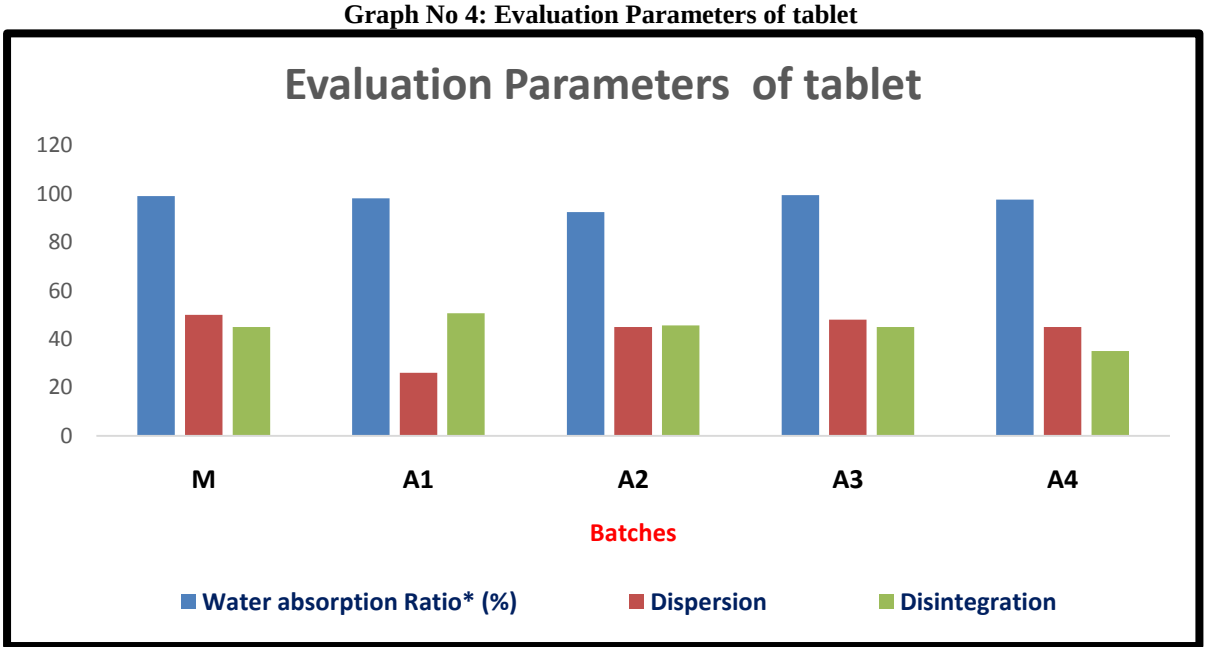


Table No.8 (c) Evaluation Parameters of tablet

Formulation Code	Water absorption Ratio* (%)	Dispersion Time* (sec)	Disintegration Time* (sec)
M	99.12	50	45
A1	98.20	26	30
A2	92.52	45	45
A3	99.51	48	45
A4	98.12	50	45

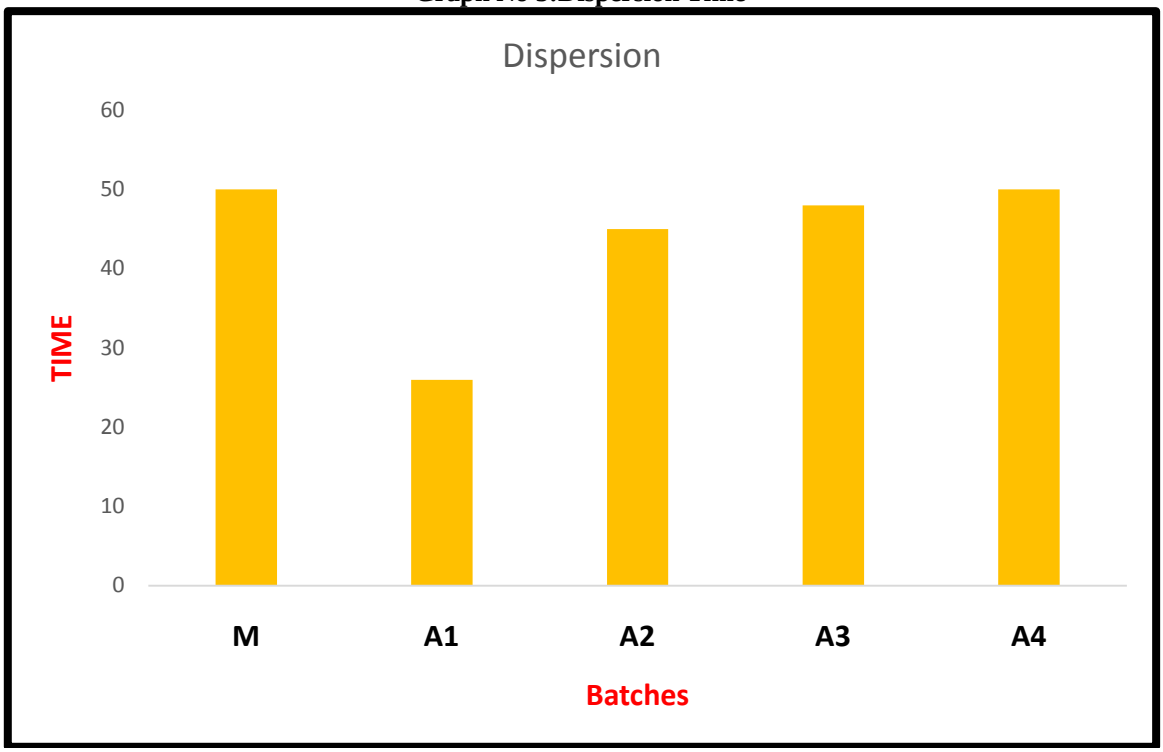
*Average of three determinations ± Standard deviation

Graph No 4: Evaluation Parameters of tablet



International Journal of Pharmaceutical Research and Applications
Volume 8, Issue 3 May-June 2023, pp: 3209-3224 www.ijprajournal.com ISSN: 2249-7781

Graph No 5:Dispersion Time



Pre-compression characteristics of tablet like Bulk density, Tapped density, Angle of Repose, Hausner's ratio, Carr's Compressibility Index by using standard procedures.

The Precomposed powder containing Aspirin showed angle of repose 26.69,25.24,26.60,and 25.20 for the batches A1,A2,A3 and A4 respectivelyi.e. Value less than 30. Hence exhibit good flow properties. (Table no. 7)

The bulk density which is indicative of packing density was found to be 0.58,0.59,0.59and and 0.58 g/cm^3 for the batches A1,A2,A3 and A4 respectivelyi.e.lower than 1.2 g/cm^3, which showed good flow properties of prepared powder.(Table no.7)

Carr's index was found to be 8.55,8.56,8.67 and 8.72 % for the batches A1,A2,A3 and A4 respectively indicating excellent compressibility. .(Table no.7)

Hausner's ratio was found to be 1.12,1.10,1.13 and 1.13 for the batches A1,A2,A3 and A4 respectively which is less than 1.5 and hence showed good flow properties. .(Table no.7)

The powder wascompressed to form the Aspirin tablets and evaluated for hardness, friability, weight variation and drug content and found within the limits. .(Table no. 8(a)

The Tablets were evaluated for the various parameters like Wetting Time, Wetting Volume, Uniformity of Dispersion, Content of Active ingredients, Water absorption Ratio, Dispersion time and disintegration test were found within the limits.(Table no. 8(b))

The Formulation Batch A4 was found to be similar as the parameters were found to be similar with special reference to Dispersion time.

VIII. SUMMARY

The present study is to formulate effervescent Tablets in such way that it may disperse within fraction of seconds as compared to the marketed preparations. Overall, the results indicate that aspirin effervescent tablet is an effective method of administering aspirin. An effervescent solution that is simple to consume is produced when the tablet dissolves fast in water. Additionally, the analysis of the tablets showed that they contained the aspirin in the labelled quantity, demonstrating the accuracy of Aspirin content.

The present study demonstrated potentials for rapid absorption, improved bioavailability, effective therapy and patient compliance. It was observed that all formulations were acceptable with

reasonable limits of standard required for Effervescent tablets.

The aspirin effervescent formulation provides a number of benefits over aspirin pills. The harsh taste of aspirin is covered up by the tablet's effervescence, which may increase patient compliance. Acute discomfort or fever can be effectively treated with this tablet due to its quick dissolving and potential for a quicker commencement of action.

Improved absorption and a quicker start of action are two benefits that the aspirin effervescent formulation may offer over regular pills. As the tablet effervesces, carbon dioxide gas is generated, resulting in a bubbly solution that can aid in breaking down the aspirin particles more quickly. This may cause the medicine to be absorbed more quickly.

The effervescent version may also be very helpful for people who have trouble swallowing conventional pills. Some patients, especially those who are elderly or have swallowing issues, may find it challenging to take big pills. The effervescent tablet's fast dissolution in water makes it may be simpler to swallow, which could increase patient compliance.

As a result, the above formulated tablet was found to be very beneficial to patients as it disperses rapidly and gives faster desired effect as compared to the marketed tablet and hence, can be used in emergency condition.

IX. CONCLUSION

It was concluded that Effervescent tablets of Aspirin can be successfully prepared by Direct compression techniques using various concentrations of citric acid and sodium bicarbonate for the better patient compliance and effective therapy. Amongst all the batches batch A4 was found to be similar with the marketed preparation for various parameters with special reference to dispersion time. and the batch A1 was having the least dispersion time as compared to marketed preparation.So with this we achieved our aim and objectives.

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