WWW.IJRPR.COM

**International Journal of Research Publication and Reviews**

Journal homepage: www.ijrpr.com ISSN 2582-7421

# Effect of different binders on disintegration And dissolution rate of various tablets

*[1]Dipak Navnath Kute, [2]Ramprasad Santosh Akhade,[3] Radhesham Ashok Joshi, [4]Pratik Bhagwan Thokare,[5] Pratham Pavan Sharma, [6]Dr Abhaykumar D Sakhare ,[7]Dr K R Biyani, [8]Dr R H Kale*

[1 2 3 4 5 6 7 8] PRMSS Anuradha College of Pharmacy, India.

**ABSTRACT :**

Binders are used in tablet formulations to enhance flexibility and hence increase inter particulate bonding strength.The research and development of new excipients are used as binding agents in tablet formulation. In The present study tablets were formulated using different types of selected binders and disintegrants and their effect on the dissolution rate was evaluated.The binding agents used were sucrose, acacia, gelatin, polyvinyl pyrrolidone (PVP), methylcellulose (MC), and hydroxypropyl methylcellulose.This is due to the fact that different binding agents can be used to achieve varying tablet mechanical strengths and drug release qualities for distinct medicinal purposes.Binders play a vital role in making sure pellets or granules And tablets remain in shape until they reach their target by holding all ingredients (API and Excipients) together in any Solid dosage form. Selecting the correct binder is critical to maintaining the integrity of the tablet. Natural binders such As various starches, Gums, mucus and dried fruits, among other things, have the ability to bind. Binders are substances that help the granules Stick together. The creation of granules of derived hardness and Size guarantees the tablet remains intact following compression While also increasing the flow characteristics. The aim of the Review is to focus on the effect of the binders like starch, sucrose, hydroxy propyl methyl cellulose, carboxy methyl Cellulose, and gelatin possess binding capacity in Tablet.The development of new excipients for potential use as binding agent in tablet Formulations continues to be of interest. This is because different binding agents can be useful in achieving Various tablet mechanical strength and drug release properties for different pharmaceutical purpose Binders are Agents employed to impart cohesiveness to the granules. This ensures the tablet remains intact after compression As well as improving the flow qualities by the formulation of granules of derived hardness and size. Natural Binders like different starch, gums, mucilages, dried fruits possesses binding capacity as well as some other Properties like filler, disintergrant & natural polymers are safe & economical than synthetic polymers like PVP.

## INTRODUCTION

Oral Route is the most common used route for drug administration. The most popular form for oral drug delivery is the tablets, which are one of the most convenient drug administration routes for the patients and they are usually easy to handle and identify.Binders are the dry powders or liquid which are added during wet granulation to promote granules or to promote cohesive compact during direct compression.It provides mechanical strength to the tablet. Binders can be in powder form and liquid form. In the case of tablet dosage form the formulation additives or excipients greatly influence the dissolution rate of poorly soluble as well as freely soluble drugs.In tablet formulation the binder and disintegrant are criticalingredients that influence the dissolution rate of drugs from tablets. Several studies reported2-7 the effect of binders and Disintegrant on the dissolution rate of drugs from tablet dosage forms.Many modern dosage forms are complex systems including Many different components in addition to the active Pharmaceutical ingredient (API). These compounds are Typically added in addition to the API to protect, sustain, or Enhance the formulation's stability. The excipients are chosen Based on their concentrations and interactions. Interaction has a Direct impact on the drug product's biological, chemical, and Physical properties.BINDERS:These are the dry powders or liquid which are added during wet granulation to promote granules or to promote cohesive compact during direct compression. It provides mechanical strength to the tablet. Binders can be in powder form and liquid form. Example of binders are Powder binders: cellulose, methyl cellulose, polyvinyl pyrrolidine, PEG Solution binders: gelatine, PVP, HPMC,HPEG, sucrose, starch.Binders can be added in the following ways to the formulation added as powder before wet agglomerisation so that the binder is evenly distributed. As solution form it is used as agglomerisation liquid in the wet granulation. It is called as liquid binder4-6.As a dry powder, which is mixed with other ingredients before compaction (slugging or tabletting). It iscalled as dry binder. Natural binders like acacia and tragacanth are used in solution form in theconcentration of 10-25%, alone (or) in combination for wet granulation and they can be added apowder for the direct compression process. Gelatine is used along with acacia (or) alone this form a better binding agent than the above two natural polymers. Polymerslike MC, HPMC are used as dry powders in case of direct compaction, they act as good binding agent , in the solution the act as good adhesives.(1)

## Method Of Preparation of tablet

- **Paracetamol : Lactose use quantity sufficient**
- Paracetamol formula with starch

| Sr no | Content | Weight for per tab | Weight for 30 tab |
|---|---|---|---|
| 1 | Paracetamol | 500 mg | 15 gm |
| 2 | Starch | 4 mg | 120 mg |
| 3 | Mg stearate | 5 mg | 150 mg |
| 4 | Talc | 5 mg | 150 mg |
| 5 | Total | 514 mg | 15.42 gm |

**Paracetamol formula with PVP**

| Sr no | Content | Weight for per tab | Weight for 30 tab |
|---|---|---|---|
| 1 | Paracetamol | 500 mg | 15 gm |
| 2 | PVP | 4 mg | 120 mg |
| 3 | Mg stearate | 5 mg | 150 mg |
| 4 | Talc | 5mg | 150 mg |
| 5 | Total | 514 mg | Gm |

**Paracetamol formula with Acacia**

| Sr no | Content | Weight for per tab | Weight for 30 tab |
|---|---|---|---|
| 1 | Paracetamol | 500 mg | 15 gm |
| 2 | Acacia | 4 mg | 120 mg |
| 3 | Mg stearate | 5mg | 120 mg |
| 4 | Talc | 5 mg | 150 |
| 5 | Total | 515 | 15.3gm |

## Material and Method :-

Materials: Paracetamol (Acetaminophen) was taken as the drug. Lactose was used as diluent. The binder materials investigated were polyvinyl pyrrolidone (PVP), corn starch paste and gelatine

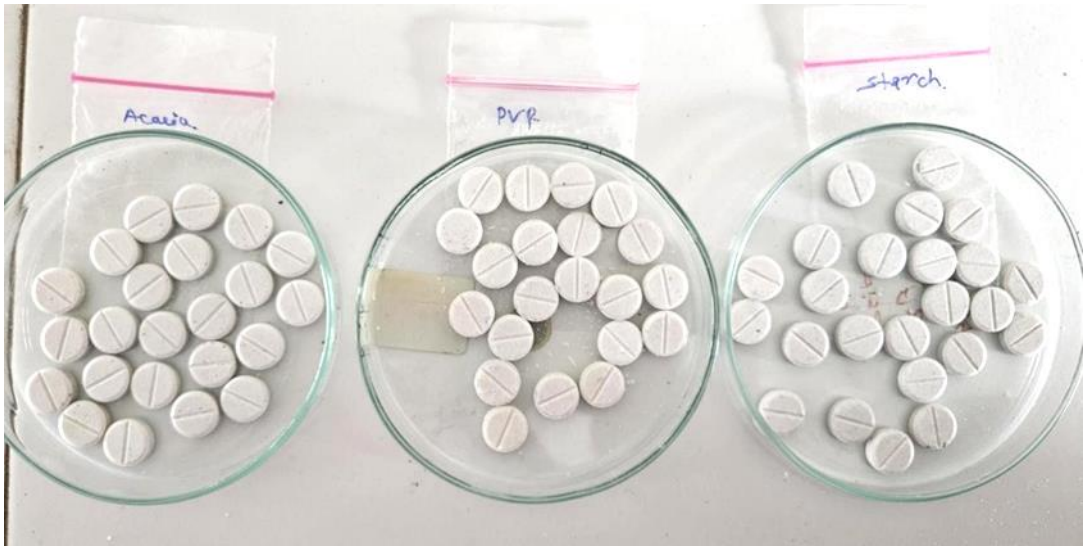
sohition acacia moclegt) Magnesium stearate was used as lubricant. Corn starch (dry) and Tale were used as disintegrant and glident, respectively. All these materials were analytical grade and purchased from Scharlau Chemicals

Apparatus: Micro pipette, Electronic Balance (Sartorius), Heater, No. 12 (710mm) and 60 meshes, Oven, Desolution test station (SRSPLUS Hanson Virtual Instrument), Disintegration Test System (QC-21), Tablet Hardness Tester, Friabulator, and UV/VIS spectrophotometer (HELIOS-Thermo Spectronic)Preparation of Calibration Curve for ParacetamolParacetamol stock solution (100ppm): A stock solution was prepared by dissolving 10mg of Paracetamol In An a 100ml volumetric flask. The solution was diluted upto the marked level.Standard Solutions for Calibration: Standard solutions at various concentrations (0.5. 1, 2, 3, 4, and 5 µgal were prepared using the stock solution, Pipetted 0.5, 1, 2, 3, 4, and 5 mi of stock solution amo six 10ml volumetic flasks and each of flasks were diluted with deionized water upto the marked level. Then from each of these flasken, Iml of solution was taken out by using 1000 µl micro pipette and transferred into a lüml volumetric flask separately and diluted with deionized water upto the mark. UV/Vis absorption was measured at wavelength of 241mm for each solution concentrations and calibration curve was prepared [Plotted Absorbance vs. Concentration (pg/mli Preparation of Starch Solution(10% w/w): Weighted 11.25g of Corn Starch imo a 250ml beaker, added 112.5mi of water and mixed well while heating at 36° C until the starch dispensed well in the solution.

General Procedure: Preparation of Dry Granules: Paracetamol tablets containing 100mg of paracetamol were prepared using three different binders according to the following 3 formulations. Formulation No.1: Weighted 50g of paracetamol, 11.25g of polyvinyl pyrrolidone (PVP), 30.875g of lactose and 10.8125g of corn starch and dry-mixed using motor and pestle for about 5 minutes. The powder mixture was blended by tumbling for 10 minutes. The blended mixture was moistened by slowly addition of alcohol to proper weiness and then kneaded well. The wet mass was screened through No.12 mesh (710mm) to prepare small granules. The granules were dried at 50° C overnig in an oven and screened through a No.20 mesh Formulation No.2: Weighted 50g of paracetamol, 30.875g of lactose and 10.8125g of corn starch and dry-mised sing motor and pestle for about 5 minutes. The dry powder mixture was blended by tumbling for 10 minutes. The blended mixture was moistened by slowly addition of 10% starch solution to proper

wetness and then kucaskol well. The wet mass was screened through No. 12 mesh (710mm) to prepare small granules. The granules were driod at 50 Covernight in an oven and screened through a No.20 mesh.

Formulation No.3: Weighted 50g of paracetamol, 30.875g of lactose and 10.8125g of corn starch and dry mixed Using motor and pestie for about 5 minutes. The misture was blended by tumbling tot 10 minutes. The blended mixture was moistened by slowly addition of 10% golatime solution to proper wetoess and then kocnded woll The wet mass was screened through No. 12 mesh (710num) to prepare small granules. The grandles were al 10 Covernight in an oven and screened through a No.20 meshPreparation of Tablets: Weiglied 2.25g of magnesium stearate, 6.75g of sale and 0.8125g of com sach, mised them together and screened the mixture rough No ho mesh. The mixture was then hieuded by tushing with the granulation and the resulting mixture was compressed uning hand tablet machine with punch diameter of Tenn About 100 tablet were prepared for each formulation.(1)




***Test for Paracetamol tablet***

- **Disintegration time:**
  The method specified in the USP/NF (1980) was used. The machine used was QC-21 Disintegration test system. Disintegration medium used was 100 ml water maintained at temperature between 35 and 39°C throughout the experiment. Six tablets selected at random from each formulation were placed one in each of the cylindrical tubes of the basket and then placed the discs in cach baskets. The time taken for cach tablet to break up into small particles and pass out through the mesh was recorded.
  Mean disintegration time was calculated for each batch.
- **Dissolution test :**
  Dissolution test were performed for 2 tablets of each formulation. According to the procedure, I L of phosphate buffer (pH 6.8) was filled into each of the six beakers of dissolution apparatus. Two tablets from each formulation were taken and placed in small baskets made from a screen mash. The baskets were then immersed in dissolution medium and rotated at a given speed. Samples (5 ml) were removed at designated time intervals (1 band t kos t_{10} ) and diluted 10 times and assayed for their paracetamol content spectrophotometrically at 243nm.(12)

**Asprin tablet formula with Sarch binder**

| Sr no | Content | Weight for per tab | Weight for 30 tab |
|---|---|---|---|
| 1 | Asprin | 300 mg | 9 gm |
| 2 | Starch | 30 mg | 900 mg |
| 3 | Mg stearate | 5 mg | 150 mg |
| 4 | Talc | 5 mg | 150 mg |
| 5 | Total | 340 mg | 10.2 gm |

**Asprin tablet formula with Acacia binder**

| Sr no | Content | Weight for per tab | Weight for 30 tab |
|---|---|---|---|
| 1 | Asprin | 300 mg | 9 gm |
| 2 | Acacia | 10 mg | 300 mg |
| 3 | Mg stearate | 5 mg | 150 mg |
| 4 | Talc | 5 mg | 150 mg |
| 5 | Total | 320 mg | 9.6 gm |

**Asprin tablet formula with PVP**

| Sr no | Content | Weight for per tab | Weight for 30 tab |
|---|---|---|---|
| 1 | Asprin | 300 mg | 9 gm |
| 2 | PVP | 15 mg | 450 mg |
| 3 | Mg stearate | 5 mg | 150 mg |
| 4 | Talc | 5 mg | 150 mg |
| 5 | Total | 325 mg | 9.65 gm |

Preparing aspirin tablets involves a few key steps, much like following a recipe for a dish. Here's a simplified overview:

- Mixing*: Start by blending the active ingredient (aspirin) with excipients like binders, fillers, and disintegrants. This ensures even distribution of the active ingredient.
- Granulation*: This step can be done using wet or dry granulation. In wet granulation, a liquid binder is added to the powder mix to form granules. In dry granulation, the powder is compressed into sheets and then broken into granules.
- Drying*: If you used wet granulation, the granules need to be dried to remove excess moisture. This is crucial to prevent degradation of aspirin.
- Compression*: The dried granules are then compressed into tablets using a tablet press. This step determines the tablet's hardness and shape.
- Coating (optional)*: If desired, the tablets can be coated for various reasons, like improving taste or controlling release.
- Quality Control*: Finally, the tablets undergo tests for disintegration, dissolution, and other equal parameters to ensure they meet standards.

**Test for asprin tablet**

***Disintegration Test***

Disintegration precedes dissolution process in tablet Dosage forms. In this study, disintegration test was Performed on both embedded and unembedded Aspirin tablets in order to ascertain the effect of
food Bolus on the disintegration and invariably dissolution Of the embedded aspirin tablets. As shown 1, the disintegration times for all the samples are in The order of S (12 + 0.12 sec) < P (30 + 0.35 sec)
< SB (16 + 0.84 min) < PB (18 + 0.59 min). S and P Passed the disintegration test (which specified 15 minutes) while SB and PB failed.
The compact food bolus layer on the tablets Prevented rapid penetration of the medium into the Inner part where the drug is embedded. Therefore the External food coating barrier has to disintegrate Before the tablet can also disintegrate. This prolonged The disintegration time of SB and PB. This Observation was in agreement with the opinion of tablet Disintegration can be delayed as a result of food Precipitate forming a film coating around the tablet Surface.

***Dissolution test***

The in vitro dissolution test was carried out on S and P according to the United State Pharmacopoeia specification (USP, 2000). The USP dissolution apparatus 2 (paddle) was used at a speed of 75 rpm in 900ml of dissolution medium (pH 4.5 acetate buffer) maintained at 37± 0.5 oC using a water bath fitted with a variable speed stirrer and heater (Erweka, DT6, GmbH, Germany). 5ml samples were withdrawn manually at 5, 10, 20, 30, 45, 60, 90, 120 and 240 minutes respectively and replaced with equal volume of fresh medium to maintain a constant dissolution volume. The samples were filtered and the absorbance measured at 265nm using a UV Spectrophotometer (Spectronic 21, Milton Roy, USA). The same procedure was repeated for SB and PB. The amount of drug released was calculated using the standard calibration graph earlier developed. The dissolution profiles of all the samples are represented as cumulative percent drugs released at each sampling interval and shown in Figure 2. Each profile is the average of six tablets.

***Effect of different binder on following tablets***

Disintegration and dissolution rate increase or decrease of various tablets by using different binder such as acacia, gelatin, Starch PVP etc.

## Effect of binders on disintegration and dissolution rate

***Paracetamol tablet:***

Effects of binder on the disintegration rate.
n Disintegration times obtained for three formulations were 13 min 52 sec, 6 min 28 sec and 8 min, respectively, and were compatible with the trend of the values obtained for average weight and hardness. Also they remain below 15 min. The intergranular bond strength decreases in the order of binders PVP > Gelatine Solution > Starch paste. The trend of disintegration times follows the similar trend as of other parameters. 3.1 & 3.3. So the values are technically and theoretically acceptable. Disintegration time is concerned, gelatine binder appear to be good for paracetamol tablet formulation. Calibration Curve: Calibration curve was prepared using standard solutions. Absorptions were measured at wavelength of 243 nm and plotted against concentrations. The equation for calibration curve with and without intercept was y = 0.07x + 0.0454(R ^ 2 = 0.9956) and y = 0.08 * 28x (R2 = 0.9864), respectively. As the calibration curve should follow y = mx the equation without intercept was used in paracetamol calculating concentrations at dissolution test .As in the procedure, 5 ml samples taken at the different time interval were 10 times diluted. Taking this into consideration, concentrations were calculated using above equation.PVP and gelatine solution, are good binders for preparation of paracetamol tablet but gelatine solution appeared to be better than the PVP binder. Starch binder is not suitable for making paracetamol tablets. Even though the variation of laboratory experimental results obtained for tablet evaluation parameters could be explained considering physe chemical properties of binders, overall quality of the all tablets does not reach the standard required for good and quality tablets. This may be due to errors in the experimental conditions, c.g. method of addition of binder, mising time etc. In order to do a complete evaluation of binder effect on the quality of tablets, it is proposed carry out following investigations for granules prepared related to powder flow properties such as angle of repose, flowahility index, bulk and tapped densities, Carr's Index, Hausner ratio, particle size and size distribution, and moisture content after preparation of granules for each and every binder being
tested.(12) The characteristics of paracetamol tablet formulatedfrom the Manihot esculenta starch and the tabletformulated from industrial starch were investigatedadopting the USP XXII rotating basket apparatus atstirring rates of 100 rpm and a temperature of 37°C,900 ml of distilled water
utilized. The samples of 10ml were withdrawn and measured spectrophotometrically at 257nm uv
Spectrometer(Shimadzu) paracetamol tablet manufactured by using Manihot esculenta starch isbetter in friability and hardness than that of tablets made up of industrial starch (Maize). As thedisintegration time for paracetamol tablets formulated by using Manihot esculenta starch has increased 60 times than that of industrial starch. It is concluded that the binding capacity of Manihot esculenta starch would be many times greater than that of industrial starch. So if the concentration of Manihot esculenta starch is decreased then the same effect may be obtained. From dissolution study paracetamol tablets formulated by using Manihot esculenta starch has increased release of 21% than that of industrial starch. If this could be proved, then it is very much beneficial to the tablet manufacturing industry as it is cheap and abundantly available. Further study on this starch as a binder at different concentrations and with different drugs would give further information which is needed to establish the usefulness of this starch, as an effective
binder in the field of tablet manufacturing.(18). The dissolving medium was phosphate buffer (pH 6.8). For one tablet of each formulation, a dissolution test was conducted. As per the protocol, six beakers containing 900ml of phosphate buffer (pH 6.8) were filled with the dissolution apparatus. Each formulation was given one tablet, which was then put in a beaker. After then, the paddle rotated at a certain speed. Five milliliter samples were taken

out at certain intervals (t10, t20, t30, t40, t50, and t60), diluted six times, and then their paracetamol concentration was measured using spectrophotometry at 256 nm . Disintegration Test System machine. 900 ml of water that was kept at a constant 37 ºC was the disintegration medium that was utilized in the experiment. Six tablets were randomly chosen from each formulation and one was placed in each of the basket's cylindrical tubes before the discs were added to each basket. It was timed how long it took for each tablet to disintegrate into tiny pieces and escape through the mesh. For every batch, the mean disintegration time was determined.

***Asprin tablet***

Different binders have varying effects on tablet disintegration and dissolution. Some binders, like acacia and starch paste, can facilitate faster disintegration and dissolution rates, while others, like HPMC and certain types of PVP, may lead to slower disintegration and dissolution. The choice of binder and its concentration significantly impact these parameters, influencing drug release and bioavailability.

When it comes to aspirin tablets, the choice of binder can significantly influence both dissolution and disintegration. For example, using binders like starch or cellulose can promote faster disintegration, allowing the aspirin to dissolve quickly in the stomach. This is crucial since aspirin is often used for its rapid pain-relieving effects.

On the other hand, if you use a binder like PVP, it might create a more cohesive tablet that disintegrates more slowly. This could be beneficial for controlled-release formulations, but not ideal if you want quick relief.

Acacia as a binder in aspirin tablets can have some interesting effects on both dissolution and disintegration.

When you use acacia, it acts not just as a binder but also as a natural gum, which can enhance the tablet's ability to break apart in the digestive system. This means that aspirin tablets with acacia might disintegrate more quickly compared to those with synthetic binders.

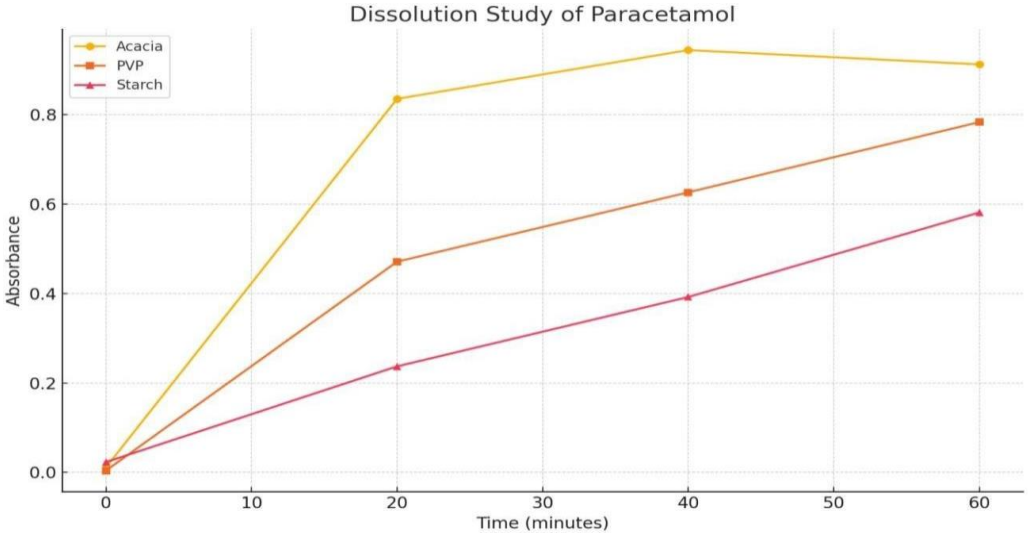
In terms of dissolution, acacia can help maintain a consistent release of aspirin into the solution. It can create a gel-like layer around the tablet, which can control the rate at which the aspirin dissolves. This is beneficial for achieving a steady absorption rate, ensuring that the medication works effectively over time.

## Conclusion

The study demonstrated that the type of binder used in tablet formulation significantly affects both the dissolution and disintegration profiles of the final product. Binders with higher viscosity and stronger binding properties, such as polyvinylpyrrolidone (PVP), tended to slow down disintegration and subsequently delay dissolution, resulting in prolonged drug release. In contrast, more soluble or less cohesive binders, like starch and acacia, promoted faster disintegration and improved dissolution rates.

Overall, the choice of binder must be carefully considered based on the desired release profile of the drug. For immediate-release formulations, binders that facilitate rapid tablet breakup and drug solubilization are preferred. Conversely, stronger binders may be more suitable for sustained-release formulations where slower drug release is advantageous.

This study highlights the critical role binders play in the performance of oral solid dosage forms and underscores the need for thorough pre-formulation testing when selecting excipients.




***Paracetamol tablets***

| Sr no | Binder | Dissolution time | Disintegration time (min) |
|---|---|---|---|
| **1** | **Acacia** | **0 min- 0.011 nm**<br>**20 min- 0.835 nm**<br>**40 min- 0.912 nm**<br>**60 min- 0.944 nm** | **3 minutes** |
| **2** | **PVP** | **0 min – 0.004 nm**<br>**20 min – 0.471 nm**<br>**40 min – 0.626 nm**<br>**60 min – 0.883 nm** | **7 minutes** |
| **3** | **Starch** | **0 min – 0.023 min**<br>**20 min – 0.237 min** | **5 minutes** |
| | | **40 min – 0.392 min**<br>**60 min – 0.581 min** | |

***Acacia binder***

Using acacia as a binder in paracetamol tablets can significantly influence both the dissolution and disintegration rates.
For disintegration, acacia helps the tablet break apart more efficiently. Its natural gum properties allow for better moisture absorption, which can lead to quicker disintegration in the gastrointestinal tract. This means that paracetamol tablets with acacia may start to dissolve faster, making the active ingredient available for absorption sooner.
When it comes to dissolution, acacia can create a gel-like barrier around the tablet, which can control the release of paracetamol. This can be beneficial for achieving a steady release profile, ensuring that the medication is absorbed at a consistent rate. However, if the gel barrier is too thick, it might slow down the dissolution rate, which could delay the onset of action.

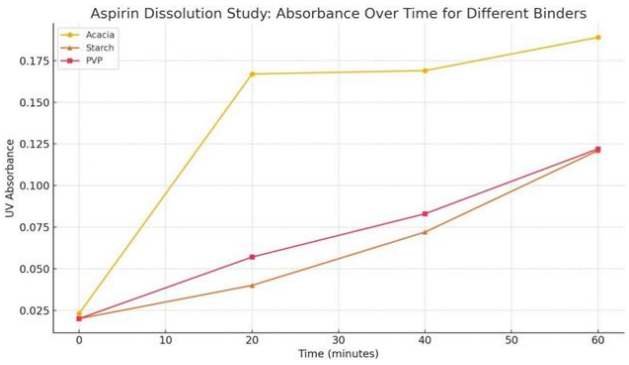
***PVP***

Using PVP (Polyvinylpyrrolidone) as a binder in paracetamol tablets can have distinct effects on both dissolution and disintegration rates.
For disintegration, PVP tends to create a more cohesive tablet structure. This means that the tablets may take a bit longer to break apart compared to those with more traditional binders like acacia. The cohesive nature of PVP can lead to a slower disintegration rate, which might delay the release of paracetamol into the solution.
In terms of dissolution, PVP can actually help in maintaining a controlled release of the active ingredient. While it may slow down the initial disintegration, once the tablet starts to dissolve, PVP can facilitate a steady release of paracetamol into the solution. This can be beneficial for achieving a prolonged effect, as it allows the medication to be absorbed gradually.

***Starch***

Starch as a binder in paracetamol tablets can have quite a positive impact on both dissolution and disintegration rates.
When it comes to disintegration, starch is known for its ability to absorb moisture quickly. This means that paracetamol tablets with starch tend to break apart faster in the gastrointestinal tract. The rapid absorption of water helps the tablet disintegrate more efficiently, making the active ingredient available for absorption sooner.
In terms of dissolution, starch can also promote a quicker release of paracetamol. Since it facilitates faster disintegration, the active ingredient can dissolve more readily in the digestive fluids. This can lead to a quicker onset of action, which is often desirable for pain relief medications like paracetamol.

***Asprin tablet***




| Sr no | Binder | Dissolution time | Disintegration time |
|---|---|---|---|
| **1** | **Acacia** | **0 min – 0.023 nm**<br>**20 min – 0.167 nm**<br>**40 min – 0.169 nm**<br>**60 min -0.189 nm** | **3 min** |
| **2** | **Starch** | **0 min – 0.020 nm**<br>**20 min -0.040 nm**<br>**40 min -0.072 nm**<br>**60 min -0.121 nm** | **6 min** |
| **3** | **PVP** | **0 min – 0.020 nm**<br>**20 min – 0.057 nm**<br>**40 min – 0.083 nm**<br>**60 min- 0.122 nm** | **8 min** |

***Acacia***

Acacia as a binder in aspirin tablets can have some intriguing effects on both dissolution and disintegration rates.
When you use acacia, it acts like a natural glue that holds the tablet together while also allowing it to break apart effectively. Its gum properties help the tablet absorb moisture quickly, which can lead to faster disintegration in the digestive system. This means that aspirin tablets with acacia may start to dissolve more rapidly, making the active ingredient available for absorption sooner.
In terms of dissolution, acacia can create a gel-like layer around the tablet. This layer can control the rate at which the aspirin dissolves, allowing for a steady release into the solution. This is beneficial for achieving a consistent absorption rate, ensuring that the medication works effectively over time.

***PVP***

Using PVP (Polyvinylpyrrolidone) as a binder in aspirin tablets can lead to some interesting dynamics in both dissolution and disintegration rates.
For disintegration, PVP tends to create a more cohesive structure in the tablet. This means that the tablets may take a bit longer to break apart compared to those with more traditional binders like acacia or starch. The cohesive nature of PVP can result in a slower disintegration rate, which might delay the release of aspirin into the solution.
When it comes to dissolution, PVP can actually help maintain a controlled release of the active ingredient. While it may slow down the initial disintegration, once the tablet starts to dissolve, PVP can facilitate a steady release of aspirin into the solution. This can be beneficial for achieving a prolonged effect, allowing the medication to be absorbed gradually.

***Starch***

Using starch as a binder in aspirin tablets can have quite a positive impact on both dissolution and disintegration rates.

For disintegration, starch is known for its ability to absorb moisture quickly. This characteristic allows aspirin tablets with starch to break apart faster in the gastrointestinal tract. The rapid absorption of water helps the tablet disintegrate more efficiently, making the active ingredient available for absorption sooner.

In terms of dissolution, starch promotes a quicker release of aspirin. Since it facilitates faster disintegration, the active ingredient can dissolve more readily in the digestive fluids. This can lead to a quicker onset of action, which is often desirable for medications like aspirin that are used for pain relief.

***Result***

Effects of different binder on tablet dissolution and Disintegration rate of various tablets was studied successfully.

**REFERENCES**


1. British pharmacopeia (BP) (2007).Electronic Edition, Crown Inc.London.& Iraqi J Pharm Sci, Vol.22(1) 2013 ,32-39.
2. Dinda SC and Mukharjee B. Gum cordia – A new tablet binder and emulsifier. Acta Pharm. Sciencia.2009; 51: 189 - 98.
3. World Journal of Biology Pharmacy and Health Sciences, 2024, 17(03), 295–302
4. Patel, D.M., prajapat, D.G., Patel, N.M., 2007, seed mucilage from ocimumamericanmumlinn. As disintegrant intablets:separation and evaluation Indian journal of pharmaceutical sciences, 69,431435.
5. Enauyatifard R. Azadbakht M. Fadakar Y. Assisment of ferula gummosa gum as abinding agent in tablet formulations. Acta Poloniacpharma. Drug Research. 2012; 69: 291-8.
6. Odeku OA, Itiola OA. Characterization of khaya gum as a in a paracetamol tablet formulation. Drug Devind Pharm 2005;28(3):329-37.
7. Rehman BM, Wahed MII, Khondkar P, Ahmed M, Islam R, Barman RK, Islam MA. Effect of starch 1500 as a binder and disintegrant in lamivudine tablets prepared by high shear wet granulation. Pak. J. Pharm. Sci. 2008; 21: 455- 9.
8. Moore [W and Flanner HH. Mathematical Comparison of Dissolution Profile. Pharm. Tech. 1996; 20: 64-74.
9. Levina M and Cunningham CR. The effect of core design and formulation on the quality of film coated tablets. Pharm. Tech. Europe. 2005; 17:29-37
10. World Journal of Biology Pharmacy and Health ScienceseISSN: 2582-5542Cross Ref DOI: 10.30574/wjbphsJournal homepage: https://wjbphs.com/297
11. Manipal Journal of Pharmaceutical Sciences, Vol. 7 [], Iss. 1, Art. 6 33-34/38
12. Der Pharma Chemica, 2016, 8(4):237-242
13. K.P.R Chowdary et al, P. Suneel Kumar, Ch. Chandra Sekhar: effect of six binders on the dissolution rate of metformin hydrochloride tablets: 5(4): 2177-2180. (2014) JGTPS, 2014, Vol. 5(4): 2177 - 2180
14. Subrahmanyam C. V. S, A Textbook of Physical Pharmaceutics, Vallabh Prakashan, 2ndedn. Delhi,2000.
15. Int.J.Pharm. Sci. Rev. Res., 70(1), September - October 2021; Article No. 05, Pages: 28-38 ,
    International Journal of Pharmaceutical Sciences Review and Research
    International Journal of Pharmaceutical & Biological Archives 2012; 3(1):223-227.
16. NeuroQuantology| October 2022 | VOLUME 20 | ISSUE 15 | PAGE 8180-8185| DOI: 10.48047/NQ.2022.20.15.NQ88814 Surendra Pardhi et al/Binders Effect on the Dissolution Rate of Metformin Hydrochloride Tablets.
17. International Journal of ChemTech Research CODEN( USA): IJCRGG ISSN : 0974-4290 Vol.2, No.1, pp 406-411, Jan-Mar 2010
18. Gunatilake SK, Adekol F. Effects of binder on the physico-chemical properties and the quality of paracetamol tablet. Der Pharma Chem. 2016;8(4):237-242.
19. Inamdar M, Momin M, Abhang P. Isolation and evaluation of fenugreek, flaxseed mucilages and its use as a pharmaceutical binder. Int. J Pharm Technol. 2012;4(3):4766-4777.
20. Effects of Plantain and Corn Starches on the Mechanical and DisintegrationProperties of Paracetamol TabletsSubmitted: March 11, 2005; Accepted: July 1, 2005; Published: October 22 2005
21. 10. Odeku OA, Itiola OA. Evaluation of khaya gum as a binder in paracetamol tablet formulation. Pharm Pharmacol Commun.1998;4:183Y188.