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Review Article

A REVIEW ON TECHNOLOGIES EMPLOYED IN FORMULATION OF MOUTH DISSOLVING TABLETS

R. Santosh Kumar and Sahithi Mudili

GITAM Institute of Pharmacy, GITAM University, Rushikonda, Visakhapatnam-45.

Abstract:

Oral route is the most preferred route for administration of various drugs because it is regarded as safest, most convenient and economical route. Recently researcher developed the mouth dissolving tablets with improved patient compliance and convenience. Upon introduction into the mouth, these tablets dissolve or disintegrate in the mouth in the absence of additional water for easy administration of active pharmaceutical ingredients. Mouth dissolving tablets overcome the disadvantages of conventional dosage form especially dysphagia (difficulty in swallowing) in paediatric and geriatric patients. Mouth dissolving tablets can be formulated by using various technologies like lyophilization, direct compression, spray drying, molding, nanotization, mass extrusion, sublimation, cotton candy and phase transition technology along with various patented technologies like zydis, lyoc, flashtab, frosta, nanocrystal technology, wowtab, durasolv, orasolv advatab and flashdose technology. This review briefly describes about the various technologies which are used for the formulation of mouth dissolving tablets along with advantages and limitations of the technology.

Keywords: Mouth dissolving tablets, Patented Technologies, Bioavailability

Corresponding author:

Dr. R. Santosh Kumar,
*GITAM Institute of Pharmacy,
 GITAM University,
 Rushikonda,
 Visakhapatnam-45,
 A.P, India.
 email:drsantoshrada@gmail.com.*

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INTRODUCTION:

Mouth disintegrating tablets are useful for pediatric, geriatric and also dysphagic patients, who are having the difficulty in swallowing. These dosage forms dissolve or disintegrate rapidly in the oral cavity within a matter of seconds without the need of water. A mouth dissolving tablet usually dissolves in the oral cavity within 15 secs to 3 min. In the recent times, several new advanced technologies have been introduced for the formulation of mouth dissolving tablets for improving the patient compliance by masking the taste of the drug and for increasing the bioavailability of the drug. Technologies include lyophilisation, molding, direct compression, cotton candy process, spray drying, sublimation, mass extrusion, nanonization and phase transition. These techniques are based on the principles of increasing porosity and/or addition of superdisintegrants and water soluble excipients in the tablets. This review article details the technologies which are useful for the formulation of mouth dissolving tablets.

Criteria for Formulation of Mouth Dissolving Tablets

- It should not require water for administration; it dissolves and disintegrates rapidly in the mouth with in fraction of seconds.
- It dissolves in the mouth, so it should have good mouth feel and taste masking property
- It should have sufficient hardness to withstand the post manufacturing activities.
- It should have the capacity to load the high amount of the drug.
- It should have more bioavailability.
- It should not get affected with environmental conditions like Temperature and humidity.
- It should not require special packing.

Advantages of Mouth Dissolving Tablets

- These tablets can be easily administrated by the patients like elders who are having the difficulty in swallowing, by children who are unable to swallow and by the psychiatric patients who refuse to swallow the tablet.
- Mouth dissolving tablets are having improved patient compliance because these tablets can be taken by the bed ridden patients and the people who are busy in travelling without need of water.
- Mouth dissolving tablets are having good mouth feel property because of these property even children also can easily take this medication.
- These tablets can be easily administrated and having the dose accuracy compared to the liquid formulation.

- Mouth dissolving tablets having the benefit of liquid medication in the solid preparation.
- By its pregastric absorption property i.e absorption form mouth, pharynx and oesophagus it shows rapid onset of action.
- It is having improved bioavailability because of its pregastric absorption activity.
- It can eliminate the problems like risk of choking or suffocation during oral administration which is the common problem during the administration of conventional tablets.
- These tablets are more beneficial where rapid onset of action required in some conditions like sudden episodes of allergic attack or coughing.

Limitations of Mouth Dissolving Tablets

- The tablets usually have insufficient mechanical strength. Hence, careful handling is required.
- If tablets are not formulated by masking the bitter taste of the drug, it can lead to unpleasant taste in mouth.
- Patients which are having decreased saliva production syndrome (Sjogren's syndrome) are unable to take these mouth dissolving tablets.
- Mouth dissolving tablets are sensitive to moisture (Hygroscopic in nature), so we have to store them in dry place only.
- Mouth dissolving tablets requires special packaging conditions for stabilization and safety of the product.

Technologies Used for Formulation of Mouth Dissolving Tablets

Following technologies are used for the formulation of the mouth dissolving tablets. They are

1. Freeze drying or Lyophilization[1]:

The main principle involved in lyophilization or freeze drying technique is removal of water from the product by freezing. Lyophilization technique is most widely used technique in pharmaceutical industries for drying of heat sensitive drugs and biologicals at low temperature under conditions that allows removal of water by sublimation. In this technique drug is dissolved and dispersed in aqueous solution carrier and this mixture is poured into the wells of the preformed blister packs and this drug solution going to freeze by passing these blister packs in to the liquid nitrogen freezing tunnel. The tablets formulated in this method shows highly porous nature and increased surface area which leads to rapid drug dissolution, increased drug absorption and

finally shows improved bioavailability of the drug. Tablets prepared by lyophilization technique shows rapid disintegration within 5 seconds due to quick penetration of saliva into pores when placed on the tongue. Figure -1 explains how lyophilization takes place by using triple point diagram in which water is removed from the product after it is frozen and placed under vacuum, allowing ice to change directly from solid to vapor without passing through liquid phase.

Drug example:

By taking the Hydrochlorothiazide as a model drug Corveleyn and Remon [2] studied the influence of various formulation and process parameters on the characteristics of orally disintegrating tablets made by lyophilization technique. They used maltodextrin, gelatin, xanthan gum hydroxyethylcellulose as excipients for orally disintegrating tablets preparation and the prepared tablets were evaluated for physical parameters like hardness, strength, porosity, disintegration time and residual moisture

.the formulation which contains maltodextrins as a matrix forming agent was found to effect the integrity and strength of the tablets, disintegration time and pore size. Formulation containing showed the stronger tablets. Xanthan gum and hydroxyethylcellulose also showed effect on the strength and disintegration time of the tablet. The formulation which containing hydroxyethylcellulose as a binder showed less disintegration time compared to xanthan gum.

Advantages:

- It is an ideal drying technique for heat sensitive products.
- Mouth dissolving tablets which are prepared by this technique shows very low disintegration time have good mouth feel due to fast melting effect.

Limitations:

- It is long and cost intensive process.
- Tablets prepared by this technique shows poor stability at higher temperature and humidity.

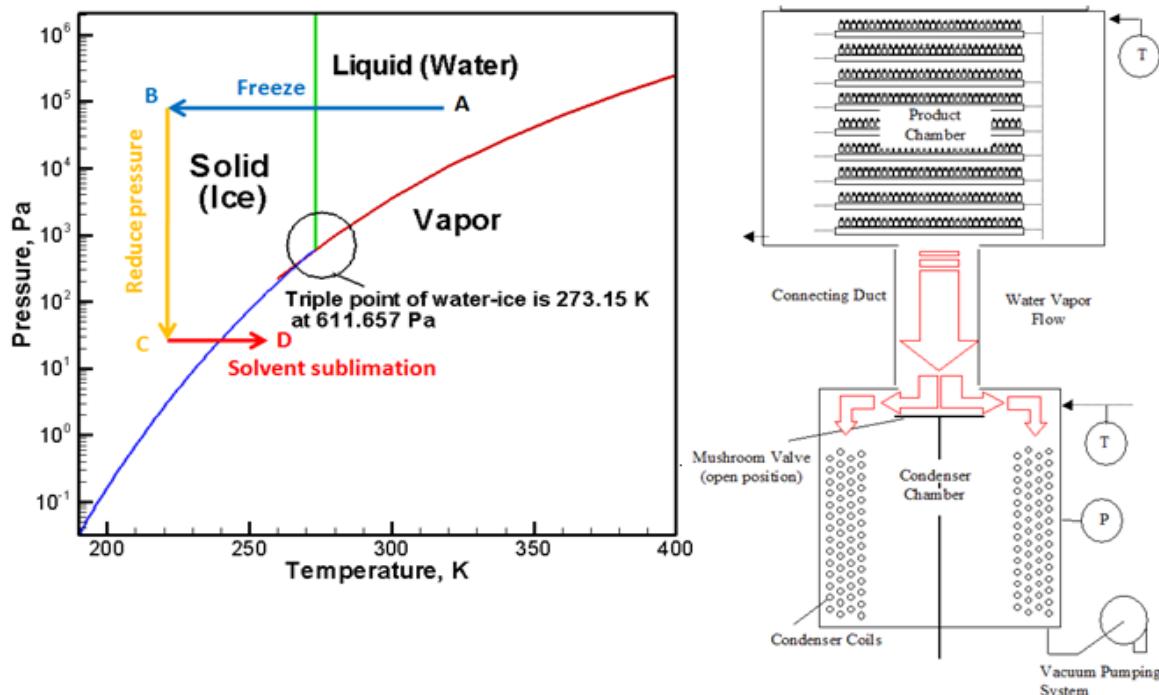


Fig. 1: Freeze Drying or Lyophilization Method

2. Molding [3]:

In this drug is mixed with water soluble ingredient with a hydro-alcoholic solvent and molded in to tablet in conventional tablet compression machine by using the lower pressure compared to less than the conventional tablets and then leads to porous nature of the tablet. This porous nature of the tablets helps in the increased drug disintegration and drug dissolution and finally leads to improved bioavailability. Molding can be divided into two types. They are

a) Compression molding:

Powder blend is mixed with hydroalcoholic solvent and it is molded into tablet using compression pressure lower than used in conventional tablets compression. Then solvent present in the molded tablet is removed by air-drying. Figure-2 describes about the compression molding process, in which preheated molding material is first placed in an open and preheated mould cavity and pressure is applied to force the material into contact with all mold areas and gives the molded tablet.

COMPRESSION MOLDING

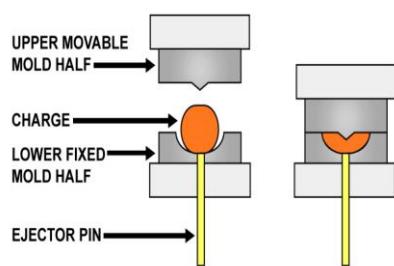


Fig. 2: Compression Molding

b) Heat molding:

In this technology suspension of drug, agar and sugar is prepared and it is going to pour in blister packing well and solidifying the agar solution at room temperature. Finally a Zell like structure will form which is dried at approximately 30°C.

c) Molding by vacuum evaporation without lyophilization:

In this process drug and excipients are mixed and prepared into slurry and poured into mold of desired dimension and going to freeze dry this mixture to form a solidified matrix. Then this matrix subjected to vacuum drying at freeze drying temperature and result into the formation of tablet. Tablets prepared

by this technique having the good mechanical strength.

Drug example:

Valdecoxib orally disintegrating tablets has been prepared by Modi and Tayade[4] by using molding or solid dispersion method to enhance the dissolution of the tablets by kneading the drug with polyvinyl pyrrolidone (PVP K-30) and compressed into tablets. The dissolution of the Valdecoxib tablets has been increased (<85% in 5 minutes) compared to marketed formulations.

Advantages:

- By using molding technique we can prepare various sizes and shapes of the tablets.
- Mouth dissolving tablets which are prepared by molding technique shows porous nature which helps in the quick disintegration and dissolution of the tablet when placed on the tongue.

Limitations:

- Tablets prepared by molding technique shows some common problems like Loss in Potency of tablet, inter tablet migration, sorption by packing materials and chemical decomposition.



3. Sublimation [5]:

In this drug is mixed with the rapidly volatized ingredients like camphor ammonium carbonate, ammonium bicarbonate, hexamethylethane amine along with other excipients and this was compressed into the tablets. After this the formulation undergoes sublimation to remove the volatized ingredients to form the porous structure of the tablet. Porous nature of the tablet helps in the increased drug disintegration and drug dissolution and finally leads to improved bioavailability. Figure: 3 describes about the sublimation process, in which drug is mixed with excipients and volatilizing agent and compressed in to tablets. This compressed tablets undergoes sublimation process in which volatilizing agent turns directly into gas without passing into liquid state and leads to development of pores on the compressed tablets. Porous nature of the tablet helps in the quick disintegration of tablet and leads to improved bioavailability.

Drug example:

Orally disintegrating Etoricoxib tablets have been developed by Patel and Patel[6] by using sublimation technique to enhance the dissolution of the drug. In this technique etoricoxib granules have been prepared by using aspartame, menthol, mannitol and crosspovidone by wet granulation technique. Menthol was sublimated from the granules by exposing the

granules to vacuum and resultant porous granules were subjected to tableting. The tablets prepared by using this technique showed improved dissolution profile compared to marketed formulation.

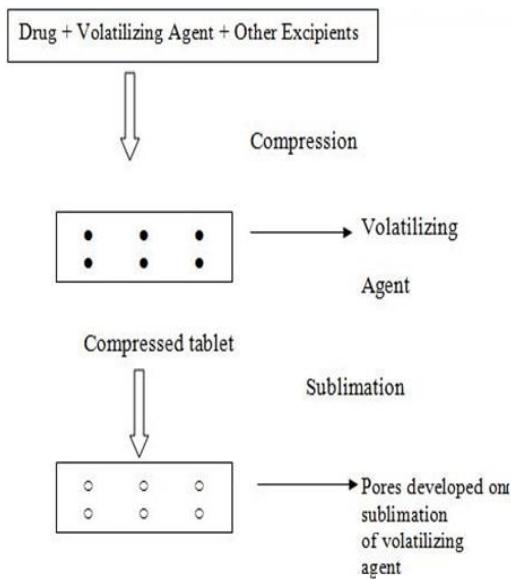


Fig. 3: Sublimation Process

4. Spray drying [7]:

Spray drying produces highly porous and fine powders that dissolve rapidly. In this technique particulate support matrix is prepared by spray drying an aqueous composition containing support matrix and other components to form highly porous and fine powder. This fine powder is then mixed with active ingredients and compressed into tablets. By hydrolyzed and non hydrolyzed gelatins as supporting agents, mannitol as bulking agent, sodium starch glycolate or croscarmellose sodium as disintegrating agent and an acidic material (citric acid) or alkali material (sodium bicarbonate) to enhance disintegration /dissolution. The tablets prepared in this method disintegrate within 20 sec when immersed in an aqueous medium. Figure:4 describes about spray drying technique in which fluid bed is placed in a reactor and applies hot gas to this fluid bed which leads to the formation of highly porous and fine powder. This fine powder is mixed with active ingredient and compressed into tablets.

Advantages:

- Tablets prepared by this method shows the fastest disintegration time i.e within 20 seconds
- Tablets prepared by this method shows the porous nature which helps in the fast disintegration and increased bioavailability of the drug.

- Taste masking of the drug can be achieved by using spray drying technology.
- It is highly economical process.

Limitations:

- The drugs which are sensitive to high temperature cannot be formulated by using spray drying technology.

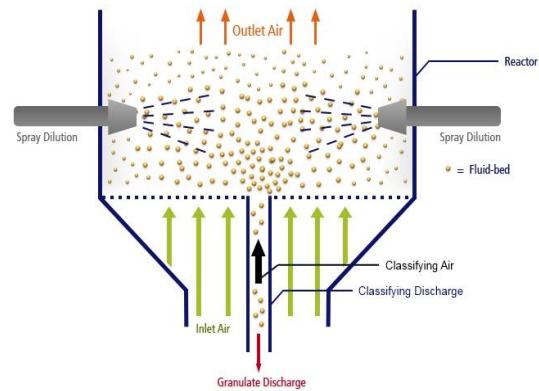


Fig. 4: Spray Drying Technique

5. Mass extrusion [8]:

In this method active ingredient is mixed with the solvent mixture of water soluble polyethylene glycol, menthol and expulsion of softened mass through the extruder or syringe to get a cylindrical shape of the product into even segments using heated blade to from tablets. In this method bitter taste of the drug can be easily masked. figure:5 describes about the mass extrusion technology in which softened mass extruded from extruder in cylindrical shape and it is cut into even segments.

Advantages:

- Fewer processing steps.
- Shows good disintegration property and increased bioavailability.
- By using this technology we can mask the bitter taste of the drug easily.

Limitations:

- Flow properties of polymers are essential to processing.

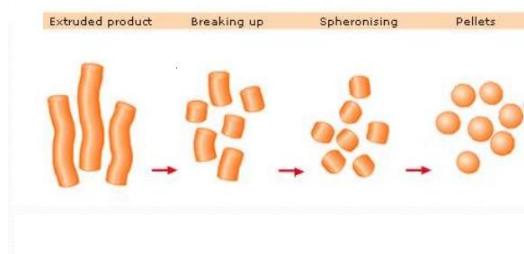


Fig. 5: Mass Extrusion Technique

6. Direct Compression [9]:

It is most cost effective tablet manufacturing technique. In this active ingredient is mixed with the other excipients and directly compressed into tablets like conventional tablets. The mixture which is going to compress into tablets must have good flow properties. In this method we can accommodate high doses of the drug. In this method we can use formulate tablets by using easily available tablets. Figure:6 describes about the direct compression method in which blend of API and excipients and lubricants are mixed and compressed into tablets by using pressure.

Advantages:

- It is simplest and most cost effective tablet manufacturing technology.
- Direct compression technique is most suitable for the moisture and heat sensitive drugs.

Limitations:

- Segregation of API and excipients takes place because of difference in density.
- Low dilution potential which means directly compressible materials can accommodate only 30-40 % of the poorly compressible active ingredients

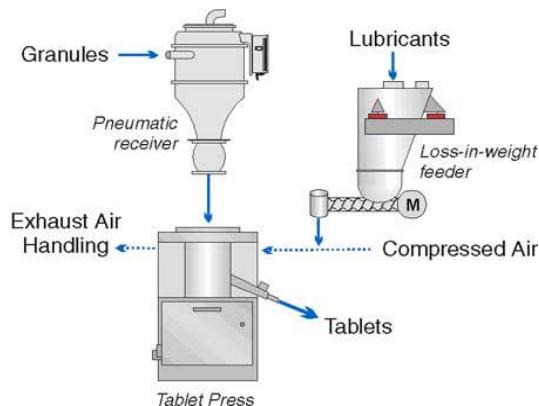


Fig. 6: Direct Compression Technique

7. Cotton Candy Process [10]:

Cotton candy process involves the formation of matrix of polysaccharides by simultaneous action of flash melting and spinning. This candy floss matrix is then milled and blended with active ingredients and excipients after recrystallization and subsequently compressed to mouth dissolving tablets. It can accommodate high doses of drug and offers improved mechanical strength. Figure-7 describes about the cotton candy process.

Advantages:

- We can accommodate large doses of drugs by using this technique.

- Tablets prepared by this method show the improved bioavailability.

Limitations:

- Thermo labile drugs cannot be formulated by using this technology because of high process temperature.

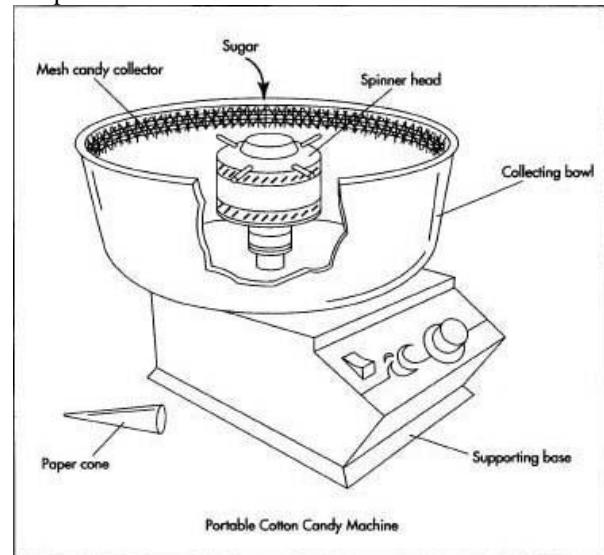


Fig. 7: Cotton Candy Technique

8. Compaction:

a) Melt granulation:

In this method mouth dissolving tablets are prepared by incorporating the drug into the hydrophilic waxy binder like PEG-6-Stearate. Hydrophilic waxy binder helps as binding and disintegrating agent. The tablets prepared by this method rapidly dissolve in the mouth without leaving any residue.

Drug example:

Carbamazepine orally disintegrating tablets have been developed by Perisutti et al[11] by melt granulation technique. In this technique carbamazepine granules were developed by using PEG 4000 as melting binder and lactose monohydrate as hydrophilic filler and crosspovidone as disintegrating agent. Carbamazepine granules which are prepared by using this technique showed enhanced in vitro drug dissolution rate.

b) Phase transition process:

In this method two types of sugar alcohols are used in which one is having the high melting point and other one is having the low melting point. The compressed powder going to heat in between these melting points and leads to increased tablet hardness due to increase of

inert particle bond induced by phase transition of lower melting points sugar alcohols. Figure-8 describes about the Phase transition process in which solid changes its phase into liquid by melting and liquid changes its state to gas by vaporization technique.

Drug example:

Kuno et al.[12] studied the effect of type of lubricant on the characteristics of orally disintegrating tablets manufactured using the phase transition of sugar alcohols. In this study they used the combination of two sugar alcohols, one was erythritol (high melting point sugar alcohol) and second one was tetrahalose (low melting point sugar alcohol). They evaluated the effect of lubricant on the characteristics of ODTs manufactured using phase transition mixture of lactose and xylitol and magnesium stearate, sodium stearyl fumarate and talc as lubricating agents. Among all three lubricants talc was recommended as the most desirable lubricant for preparation of ODTs by phase transition of sugar alcohols.

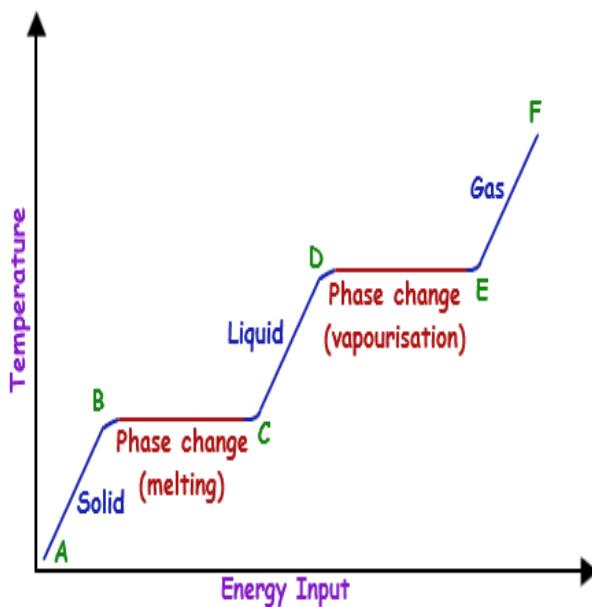


Fig.8: Phase Transition Process

9. Nanonization [13]:

In this method by using wet milling technique the size of the drug milled into nano size. This milled nano sized drug particles are stabilized against agglomeration by surface absorption on selected stabilizers and this is formulated into mouth dissolving tablets. This method is mostly employed for water soluble drugs for increasing the solubility of the drug which leads to increased bioavailability of the drug.

Advantages:

- Cost effective manufacturing process.
- Conventional packaging due to exceptional durability and wide range of doses.

Patented Technologies

1. Zydis (Cardinal Health Inc.)[14]

In this technology lyophilization of the drug takes place in a matrix which consisting of gelatin. Zydis tablet required special packaging because these tablets are very light weight and fragile in nature. Zydis tablet itself acts as self-preserved, it do not allow the microbial growth in the formulation because final water concentration in freeze-dried product is too low. By using this technology we can formulate both water soluble and water insoluble drugs as mouth dissolving tablets. The preferred drugs are water insoluble, low dose, chemically stable, small particle size and tasteless. Figure-9 describes about the zydis technology.

Advantages:

- Mouth dissolving tablets which are produced by zydis technology shows quick dissolution.
- Tablets prepared by this technology acts as a self-preserved agents because freeze drying and shows the increased bioavailability of the drug.

Limitations:

- It is very expensive process
- Tablets prepared by this technology show the poor stability at higher temperature and humidity.

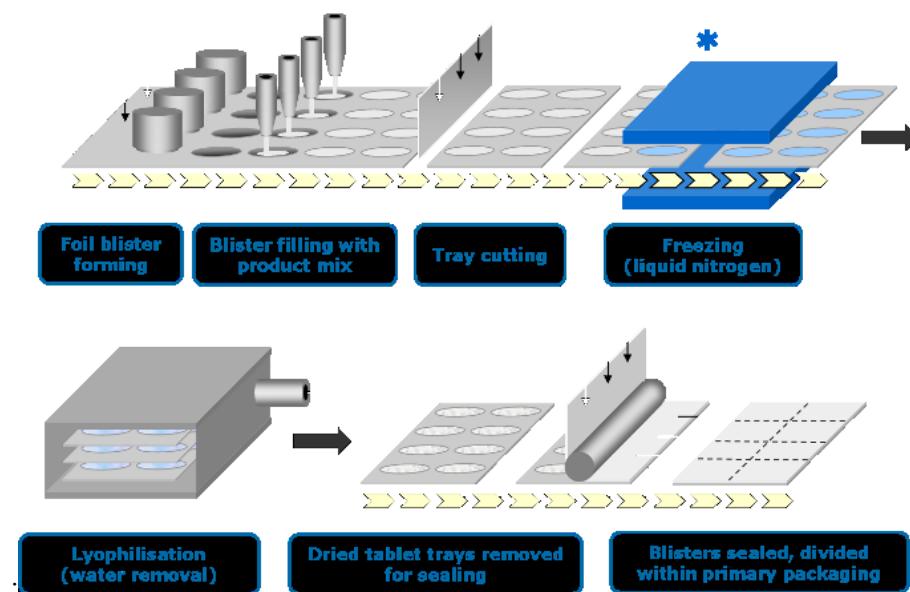


Fig.9: ZYDIS Technology

2. Lyoc (Cephalon Corporation)[15]

This technology uses the freeze drying process. In this drug is suspended into liquid solution which contains fillers, thickening agents, surfactant, non-volatile flavoring agents and sweeteners. This liquid suspension going to pour in the blister cavities and subjected to freeze drying. To prevent in homogeneity by sedimentation during this process, these formulations require a large proportion of undissolved inert filler (mannitol), to increase the viscosity of the in process suspension. The tablets prepared by this technique are denser in nature.

Advantages:

- Heat sensitive drugs can be formulated into mouth dissolving tablets by using this technology.

Limitations:

- Tablets prepared by this technology will have low mechanical strength.
- In this technology tablets are prepared by using high portions of fillers which leads to the reduction in porosity of tablet and resulting into slower disintegration.

3. Wowtab (Yamanouchi Pharma Technologies, Inc.)[16]

'Wow' means 'without water'. In this technology two types of saccharides are going to use, in them one is high mouldability saccharide and second one is low mouldability saccharide. The drug is going to mix with the

low mouldability saccharides (e.g. mannitol, lactose, glucose, sucrose, and erythritol) and then granulated with high mouldability saccharides (e.g. maltose, maltitol, and sorbitol) and then compressed into tablet. The tablets prepared by this method dissolve quickly with in 15sec or less.

Advantages:

- The tablets prepared by using this technology show the increased dissolution rate and hardness.
- Mouth dissolving tablets prepared by this technology provides the good mouth feeling effect.

Limitations:

- Wow tab technology could not show any improvement in the Bioavailability of the drug.

4. Flashtab (Prographarm)[17]

In this technology first drug is coated with a eudragit polymer and microencapsulated with an effervescent couple to produce flash dispersal tablet. This technology uses both the methods like wet and dry granulation method for the formulation of granules and these granules are compressed into tablets. In this method super disintegrants plays a main role in the disintegration of the tablet.

Advantages:

- Flashtab technology purely based on the conventional tablet technology.

- It is cost effective technology.
- Tablets prepared by this technology disintegrate within 1 minute in mouth.

Limitations:

- Coating of granules and microencapsulation of the drug plays a critical role in this technology.

5. Durasolv (Cima Labs, Inc.)(18)

DuraSolv technology is invented by Cima Labs.

Durasolv is compatible for low dose drug not compatible for larger doses drug. In this technology high pressure is used for tablet compaction. Formulation prepared by this technology can be packed into blister packs or vials. DuraSolv tablets consist of active ingredient, fillers and lubricants. The tablets prepared by this technology have higher mechanical strength.

Advantages:

- By using this technology we can mask the bitter taste of the drug.
- The tablets prepared by this technology show high rigidity and good mechanical strength.

Limitations:

- We can't accommodate large doses of drugs into this tablet.
-

6. Orasolv (Cima Labs, Inc.)(19)

It based on direct compression of an effervescent agent and taste masked drug. The use of effervescence causes a tablet to disintegrate rapidly in less than 1 min on contact with water or saliva leaving coated drug powder. This technology can accommodate a wide range of active ingredient from 1 mg to 500 mg. The effervescence occurs due to chemical reaction between organic acid such as Citric Acid, Fumaric Acid or Maleic Acid and a base such as Sodium Bicarbonate, Potassium Bicarbonate, and Magnesium Bicarbonate, which result in generation of CO₂. Micro particles, effervescent agents and other ingredient such as flavors, sweeteners, colorants and lubricants are blended and compressed at a low degree of compaction.

Advantages:

- By using this technology we can mask the bitter taste of the drug.
- Tablets prepared by using this technology show the quick dissolution and increased bioavailability.

Limitations:

- Mouth dissolving tablets which are prepared by this technology shows the low mechanical strength.
-

7. Frosta (Akina)(20)

This technology mainly involves the formulation of plastic granules and compressed them at low pressure by using conventional tablets technology. Plastic granules composed of Porous and plastic material, water penetration enhancer and binder. The tablets produced by this method are strong and having high porosity nature. Mouth dissolving tablets prepared by this method are disintegrates rapidly within 15 to 30sec.

Advantages:

- Tablets prepared by this technology shows excellent hardness and fast disintegration time.

8. AdvaTab (Eurand)(20)

In this technology, microencapsulation process is used for coating the drug particles with gastro soluble polymer so as to mask the taste along with restriction of drug dissolution in mouth cavity. AdvaTab tablets disintegrate rapidly in the mouth, typically in less than 30 seconds.

Advantages:

- High dose drugs can be formulated into tablets by using this technology.
- Special packaging not required. Tablets can be packed into both standard bottles and push through blisters.

Limitations:

- Tablets which are prepared by using this technology show decreased mechanical strength.

9. Flashdose (Fuisz Technologies, Ltd.)(21)

This uses the combination of shear form and ceform technologies in order to mask the bitter taste of the drug. Flahdose manufacturing can be divided into four steps, they are

- 1) Floss blend
 - 2) Floss processing
 - 3) floss chopping and conditioning
 - 4) tablet blend and compression.
- Flashdose technology utilizes a unique spinning mechanism to produce a floss-like crystalline structure, much like cotton candy. This crystalline sugar can then incorporate the active drug and be compressed into a tablet. It disperses and dissolves quickly. Instead of a floss-like material, small spheres of saccharides can be produced to carry the

drug. The process of making microspheres has been patented by Fuisz, and is known as ceform and serves as an alternative method of taste masking. Ceform technology involves preparation of microspheres of the active drug. Drug material alone or in combination with other pharmaceutical substances, and excipients is placed into a rapidly spinning machine. The centrifugal force comes into action, which throws the dry drug blend at high speed through small heated openings. Due to the heat provided by carefully controlled temperature, drug blend liquefies to form a sphere, without affecting the drug stability. The formed microspheres are compressed into tablet.

Advantages:

- The tablets prepared by this technology shows increased surface area, which helps in the increased dissolution of the drug.

Limitations:

- Drugs which are sensitive to heat, moisture and humidity cannot be formulated into Mouth dissolving tablets by using this technology.

10. NanoCrystal Technology (Elan Corporation):

NanoCrystal technology has been developed by Elan Corporation. Name itself defines that it is developed by decreasing the particle size and increases the surface area which results in the increased dissolution rate and bioavailability of the drug. In this technology particle size of the drug should be less than 1000 nm in diameter. Particle size of the drug can be decreased by wet milling process. Mouth dissolving wafers are prepared by mixing of nano crystal colloidal dispersions of drug substance with water soluble GRAS (Generally Regarded as Safe) ingredients and poured into blisters and lyophilized. Wafers prepared by this technology shows quick disintegration when come in contact with water.

Advantages:

- This technology highly useful for the highly potent and hazardous materials because it avoids manufacturing operations such as granulation, blending, and tableting, which generate large quantities of aerosolized powder and present much higher risk of exposure.

- Small doses of the drug can also be formulated into mouth dissolving tablets by using this technology.

11. Quick-Dis Technology (Lavipharm)[22]

Quick-Dis Technology is invented by Lavipharm laboratories. By using quick-dis technology can manufacture thin, flexible and quick dissolving film. Mouth dissolving film when placed on the tongue dissolves rapidly on the tongue and helps in the local and systemic absorption of the drug. Mouth dissolving films which are prepared by using quick-dis technology shows the quick disintegration time ranges from 5 to 10 seconds.

12. EFVDAS (Elan Corporation)[23]

EFVDAS technology is a patented technology developed by Elan Corporation. EFVDAS also called as effervescent drug absorption system which is being used to develop both over to counter (OTC) and prescription medications. EFVDAS technology has been modified by Elan corporation for the development of hot drink sachet products which is the combination of medicine and vitamins for over to counter (OTC) medication purpose. Hot drink sachet when added to boiling water it produces pleasant flavored solutions with effervescent granules. Mouth dissolving tablets prepared by this technology is useful for the treatment of cold and flu.

13. Fast Melt (Elan Corporation)[24]

Fast melts tablets are prepared by using combination of effervescent base and active ingredient. These type of tablets are highly porous in nature when place in the mouth dissolves rapidly on the tongue and avoid first pass effect and helps in the increasing the bioavailability of the drug. Fast melt tablets show approximately 15 to 30 seconds disintegration time. Fast melts tablets shows the improved patient compliance. Fast melts tablets are helpful in such cases like where on set of action is required.

14. Multiflash (Programpharm)[25]

In this technology tablet is manufactured by using coated micro granules and fast disintegrating excipients. tablets prepared by using this technique disintegrates quickly in the oesophagus without mucosal adhesion.

Following Table-1 Describes the Patented Technologies and their Brand Names which are formulated using basic technologies.

Table-1: List of Marketed Products and Patented Technologies[25-29]

Patented technology	Basis of technology	Active ingredient	Brand name	Drug release
Zydis	Lyophilization	Loratadine	Claritin reditab and Dimetapp quick dissolve	Dissolves in 2 to 10 sec.
Orasolv	Direct compression	Paracetamol zolmitriptan	Tempraquicklets, Zolmigrepimelt	Disintegrates in 5 to 45 sec
Durasolv	Direct compression	Hyoscyamine sulfate zolmitriptan	NuLev,Zolmig ZMT	Disintegrates in 5-45 sec
Wowtab	Direct compression	Famotidine	Gaster D	Disintegrates in 5-45 sec
Flashdose	Cotton candy process	Tramadol HCl	Relivia flash dose	Dissolves within 1 minute
Flashtab	Direct compression	Ibuprofen	Nurofen Flash Tab	Dissolves within 1 minute
Quicksolv	Lyophilization	Cisapride monohydrate risperidone	Propulsidquicksolv Risperdal MTab	---
Lyoc	Lyophilization	Phloroglucinol hydrate	SpasfonLyoc	---
Ziplets	Direct compression	Ibuprofen	Cibalgina due fast	---
Advatab	Microcaps and diffuscap CR technology	Cetrizine paracetamol	Adva Tab cetrizine, Adva Tab paracetamol	Disintegrates in less than 30 secs.
Oraquick	Micromask taste masking	Hyoscyamine sulfate ODT	Hyoscyamine sulfate ODT	---

Following Table-2 describes the marketed formulations along with category.

Table-2: Marketed Formulations along with Category[30-31]

API	Trade name	Category
Piroxicam	Felden fast melt	NSAID
Loratadine	Claritin redi Tab	Antihistamine
Rizatriptan	Maxalt MLT	Migrane
Olanzapine	Zyprexa	Antipsychotic agent
Famotidine	Pepcid RPD	Antiulcer
Ondansetron	Zofran ODT	Anti-emetic
Zolmitriptan	Zoming-ZMT	Anti-migraine
Selegilline	Zeplar TM	Parkinson's disease
Acetaminophen	TempraQuiclets	Analgesic
Paracetamol	Febrectol	Anti-pyretic and analgesic
Nimesulide	Nimulid MDT	NSAID
Rofecoxib	Torrox MT	Used in treatment of osteoarthritis
Olanzapine	Olanexinstab	Antipsychotic agent
Montelukast	Romilast	Anti-allergic drug
Diphenhydramine and pseudoephedrine	Benadryl Fastmelt	Allergy, sinus pressure relief
Cisapride monohydrate	PropulsidQuicksolv	Gastrointestinal prokinetic agent
Risperidone	Risperdal MTab	Schizophrenia
Ibuprofen	NurofenFlashTab)	NSAID
Paracetamol	TempraQuicklets	Anti-pyretic and analgesic
Zolmitriptan	ZolmigRepimelt	Anti-migraine
Ibuprofen	CibalginaDueFast	NSAID
Tramadol HCl	Relivia Flash dose	Analgesic
Hyoscyamine Sulfate	Hyoscyamine Sulfate ODT	Anti-ulcer

CONCLUSION:

Mouth dissolving tablets have better patient acceptance and offer improved biopharmaceutical properties, improved efficacy and better safety as compared with conventional oral dosage forms. By using new manufacturing technologies, many drugs can be formulated in the form of mouth dissolving tablets to provide the advantages of liquid medication in the form of solid preparation. The key to mouth dissolving tablets formulations is fast disintegration, dissolution, or melting in the mouth, and this can be achieved by producing the porous structure of the tablet matrix or adding superdisintegrant and/or effervescent excipients. Among all conventional technologies lyophilization technique is the most useful technique for the formulation of mouth dissolving tablets. In lyophilization technique we can formulate heat sensitive drugs and biologics with lower disintegration time where as in other techniques like heat moulding, spray drying requires high amount of temperature for the formulation of mouth dissolving tablets.

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