Review Article

Available online through
www.ijrap.net

IJRAP
ISSN 2229-3566

# MOUTH DISSOLVING TABLET: AN OVERVIEW

Kulkarni S. D.*, Pawar S. P., Bakliwal S. R., Rane B. R., Gujrathi N. A.
P.S.G.V.P.M's College of Pharmacy, Shahada, Dist. Nandurbar, Maharashtra, India

Received on: 19/06/2011 Revised on: 24/07/2011 Accepted on: 05/08/2011

**ABSTRACT**
Mouth dissolving Tablets disintegrate and/or dissolve rapidly in the saliva without the need for water. Some tablets are designed to dissolve in saliva extremely fast, within a few seconds, and are true fast-dissolving tablets. Others contain agents to enhance the rate of tablet disintegration in the oral cavity, and are more appropriately termed fast-disintegrating tablets, as they may take up to a minute to completely disintegrate. Mouth or Fast dissolving tablets have been formulated for pediatric, geriatric and bedridden patients and in the many elderly persons will have difficulties in taking conventional oral dosage forms because of hand tremors and dysphagia. The technologies used for manufacturing fast-dissolving tablets are freeze-drying, spray-drying, molding, sublimation, sugar-based excipients, compression, and disintegration addition. As a result of increased life expectancy, the elderly constitute a large portion of the worldwide population today. These people eventually will experience deterioration of their physiological and physical abilities.
**Key Word:** Mouth dissolving tablet, Fast dissolving tablet, Dosage form

***Corresponding Author**
S. D Kulkarni, 2nd year M.pharm Student, Department of Quality Assurance, P.S.G.V.P.M's College of Pharmacy, Shahada, Dist. Nandurbar- 425409, Maharashtra, India Email: sunitdkul@gmail.com

## INTRODUCTION

Oral routes of drug administration are the most popular route of administration. The most popular solid dosage forms are being tablets and capsules; one important drawback of this dosage forms for some patients, is the difficulty to swallow. Drinking water plays an important role in the swallowing of oral dosage forms. Often times people experience inconvenience in swallowing conventional dosage forms such as tablet when water is not available, in the case of the motion sickness (kinetosis) and sudden episodes of coughing during the common cold, allergic condition and bronchitis. For these reason, tablets that can rapidly dissolve or disintegrate in the oral cavity have attracted a great deal of attention. Oral dispersible tablets are not only indicated for people who have swallowing difficulties, but also are ideal for active people. Mouth dissolving tablets are also called as fast dissolving tablets, melt-in mouth tablets, Oral dispersible tablets, rapimelts, porous tablets, quick dissolving etc. Mouth dissolving tablets are those when put on tongue disintegrate instantaneously releasing the drug which dissolve or disperses in the saliva. The faster the drug into solution, quicker the absorption and onset of clinical effect. Some drugs are absorbed from the mouth, pharynx and esophagus as the saliva passes down into the stomach. In such cases, bioavailability of drug is significantly greater than those observed from conventional tablets dosage form. The advantage of mouth dissolving dosage forms are increasingly being recognized in both, industry and academics. Their growing importance was underlined recently when European pharmacopoeia adopted the term "Oral dispersible tablet" as a tablet that to be placed in the mouth where it disperses rapidly before swallowing. According to European pharmacopoeia, the ODT should disperse/disintegrate in less than three minutes. The basic approach in development of FDT is the use of superdisintegrants like cross linked carboxymethyl cellulose (croscarmellose), sodium starch glycolate (primogel, explotab), polyvinylpyrollidone (polyplasdone) etc, which provide instantaneous disintegration of tablet after putting on tongue, their by release the drug in saliva. The bioavailability of some drugs may be increased due to absorption of drug in oral cavity and also due to pregastric absorption of saliva containing dispersed drugs that pass down into the stomach. More ever, the amount of drug that is subjected to first pass metabolism is reduced as compared to standard tablet. The technologies used for manufacturing fast-dissolving tablets are freeze-drying, spray-drying,

tablet molding, sublimation, sugar-based excipients, tablet compression, and disintegration addition. As a result of increased life expectancy, the elderly constitute a large portion of the worldwide population today. These people eventually will experience deterioration of their physiological and physical abilities.

**Definition**

A Mouth dissolving drug delivery system, in most cases, is a tablet that dissolves or disintegrants in the oral cavity without the need of water or chewing.

**Advantages of FDT**

1. Administration to the patients who cannot swallow, such as the elderly, stroke victims, bedridden patients, patients affected by renal failure & patients who refuse to swallow such as pediatric, geriatric & psychiatric patients.
2. Achieve increased bioavailability/rapid absorption through pregastric absorption of drugs from mouth, pharynx & oesophagus as saliva passes down.
4. Good mouth feel property helps to change the perception of medication as bitter pill particularly in pediatric patients.
5. The risk of chocking or suffocation during oral administration of conventional formulations due to physical obstruction is avoided, thus providing improved safety.
6. New business opportunity like product differentiation, product promotion, patent extension and life cycle management[1,2].

**Requirements of mouth dissolving tablets**

An ideal MDT should

1. Require no water for oral administration, yet dissolve/ disperse/ disintegrate in mouth in a matter of seconds.
2. Have a pleasing mouth feel.
3. Have an acceptable taste masking property.
4. Must be harder and less friable.
5. Leave minimal or no residue in mouth after administration.
6. Exhibit low sensitivity to environmental conditions (temperature and humidity).
7. Allow the manufacture of tablet using conventional processing and packaging equipments[3].

**Following conventional techniques are used for preparation of mouth dissolving drug delivery system**

**Disintegrant Addition**

Disintegrant addition technique is one popular technique for formulating Fast-dissolving tablets because of its easy implementation and cost-effectiveness. The basic principle involved in formulating Fast-dissolving tablets by disintegrant addition technique is addition of superdisintegrants in optimum concentration so as to achieve rapid disintegration along with the good mouth feel. List of superdisintegrants is shown in Table 1.

**Freeze Drying**

A process in which water is sublimed from the product after freezing. Lyophilization is a pharmaceutical technology which allows drying of heat sensitive drugs and biological at low temperature under conditions that allow removal of water by sublimation. Lyophilization results in preparations, which are highly porous, with a very high specific surface area, which dissolve rapidly and show improved absorption and bioavailability.

**Moulding**

In this method, molded tablets are prepared by using water-soluble ingredients so that the tablets dissolve completely and rapidly. The powder blend is moistened with a hydro-alcoholic solvent and is molded into tablets under pressure lower than that used in conventional tablet compression. The solvent is then removed by air-drying. Molded tablets are very less compact than compressed tablets. These possess porous structure that enhances dissolution.

**Sublimation**

The slow dissolution of the compressed tablet containing even highly water-soluble ingredients is due to the low porosity of the tablets. Inert solid ingredients that volatilize readily (e.g. urea, ammonium carbonate, ammonium bicarbonate, hexa methelene tetramine, camphor etc.) were added to the other tablet ingredients and the mixture is compressed into tablets. The volatile materials were then removed via sublimation, which generates porous structures. Additionally, several solvents (e.g. cyclohexane, benzene) can be also used as pore forming agents.

**Spray-Drying**

Spray drying can produce highly porous and fine powders that dissolve rapidly. The formulations are incorporated by hydrolyzed and non hydrolyzed gelatins as supporting agents, mannitol as bulking agent, sodium starch glycolate or crosscarmellose sodium as disintegrating and an acidic material (e.g. citric acid) and/ or alkali material (e.g. sodium bicarbonate) to enhance disintegration and dissolution. Tablet compressed from the spray dried powder disintegrated within 20 seconds when immersed in an aqueous medium.

**Mass-Extrusion**

This technology involves softening the active blend using the solvent mixture of water soluble polyethylene glycol, using methanol and expulsion of softened mass through the extruder or syringe to get a cylinder of the product into even segments using heated blade to form tablets. The dried cylinder can also be used to coat

granules of bitter tasting drugs and thereby masking their bitter taste.

**Direct Compression**

It is the easiest way to manufacture tablets. Conventional equipment, commonly available excipients and a limited number of processing steps are involved in direct compression. Also high doses can be accommodated and final weight of tablet can easily exceed that of other production methods. Directly compressed tablet disintegration and solubility depends on single or combined action of disintegrants, water soluble excipients and effervescent agent[4,5].

**Patented technologies for fast dissolving tablets**

**Zydis Technology**

A Zydis tablet is produced by lyophilizing or freeze-drying the drug in a matrix usually consisting of gelatin. The product is very lightweight and fragile, and must be dispensed in a special blister pack. Patients should be advised not to push the tablets through the foil film, but instead peel the film back to release the tablet. The Zydis product is made to dissolve on the tongue in 2 to 3 seconds. The Zydis formulation is also self-preserving because the final water concentration in the freeze-dried product is too low to allow for microbial growth.

**Durasolv Technology**

Durasolv is the patented technology of CIMA labs. The tablets made by this technology consist of a drug, fillers and a lubricant. Tablets are prepared by using conventional tableting equipment and have good rigidity. These can be packed into conventional packaging system like blisters. Durasolv is an appropriate technology for products requiring low amounts of active ingredients[11].

**Orasolv Technology**

Orasolv Technology has been developed by CIMA labs. In this system active medicament is taste masked. It also contains effervescent disintegrating agent. Tablets are made by direct compression technique at low compression force in order to minimize oral dissolution time. Conventional blenders and tablet machine is used to produce the tablets. The tablets produced are soft and friable and packaged in specially designed pick and place system.

**Flash Dose Technology**

Flash dose technology has been patented by Fuisz. Nurofen meltlet, a new form of ibuprofen as melt-in-mouth tablets, prepared using flash dose technology is the first commercial product launched by Biovail Corporation. Flash dose tablets consist of self binding shear form matrix termed as "floss". Shear form matrices are prepared by flash heat processing.

**Wowtab Technology**

Wowtab Technology is patented by Yamanouchi Pharmaceutical Co. WOW means "Without Water ". In this process, combination of low mouldability saccharides and high mouldability saccharides is used to obtain a rapidly melting strong tablet. The active ingredient is mixed with a low mouldability saccharide and granulated with a high mouldability saccharide and com pressed into tablet.

**Flashtab Technology**

Prographarm laboratories have patented the Flashtab technology. Tablets prepared by this system consist of an active ingredient in the form of micro crystals. Drug micro granules may be prepared by using the conventional techniques like coacervation, micro encapsulation, and extrusion spheronisation. All the processing utilized conventional tabletting technology[6].

**Drugs to be promising incorporated in mouth dissolving tablets**

There are no particular limitations as long as it is a substance which is used as a pharmaceutical active ingredient.

**Analgesics and Anti-inflammatory Agents**

Aloxiprin, Auranofin, Azapropazone, Benorylate, Diflunisal, Etodolac, Fenbufen, Fenoprofen Calcim, Flurbiprofen, Ibuprofen, Indomethacin, Ketoprofen, Meclofenamic Acid, Mefenamic Acid, Nabumetone, Naproxen, Oxaprozin, Oxyphenbutazone, Phenylbutazone, Piroxicam, Sulindac.

**Anthelmintics**

Albendazole, Bephenium Hydroxynaphthoate, Cambendazole, Dichlorophen, Iverrnectin, Mebendazole, Oxarnniquine, Oxfendazole, Oxantel Embonate, Praziquantel, Pyrantel Embonate, Thiabendazole.

**Anti-Arrhythmic Agents**

Amiodarone, Disopyramide, Flecainide Acetate, Quinidine Sulphate,

**Anti-bacterial Agents**

Benethamine, Penicillin, Cinoxacin, Ciprofloxacin, Clarithromycin, Clofazimine, Cloxacillin, Demeclocycline, Doxycycline, Erythromycin, Ethionamide, Imipenem, Nalidixic Acid, Nitrofurantoin, Rifampicin, Spiramycin, Sulphabenzamide, Sulphadoxine, Sulphamerazine, Sulphacetamide, Sulphadiazine, Sulphafurazole, Sulphamethoxazole, Sulphapyridine, Tetracycline, Trimethoprim.

**Anti-coagulants**

Dicoumarol, Dipyridamole, Nicoumalone, Phenindione. Anti-Depressants: Amoxapine, Ciclazindol, Maprotiline, Mianserin, Nortriptyline, Trazodone, Trimipramine Maleate., Acetohexamide, Chlorpropamide,

Glibenclamide, Gliclazide, Glipizide, Tolazamide, Tolbutamide.

**Anti-Epileptics**

Beclamide, Carbamazepine, Clonazepam, Ethotoin, Methoin, Methsuximide, Methylphenobarbitone, Oxcarbazepine, Paramethadione, Phenacemide, Phenobarbitone, Phenytoin, Phensuximide, Primidone, Sulthiame, Valproic Acid.

**Anti-Fungal Agents**

Amphotericin, Butoconazole Nitrate, Clotrimazole, Econazole Nitrate, Fluconazole, Fiucytosine, Griseofulvin, Itraconazole, Ketoconazole,Miconazole, Natamycin, Nystatin, Sulconazole Nitrate, Terbinafine, Terconazole, Tioconazole, Undecenoic Acid.

**Anti-Hypertensive Agents**

Amlodipine, Carvedilol, Benidipine, Darodipine, Dilitazem, Diazoxide, Felodipine, Guanabenz Acetate, Indoramin, Isradipine, Minoxidii, Nicardipine, Nifedipine, Nimodipine, Phenoxybenzamine, Prazosin, Reserpine, Terazosin.

**Anti-Malarials**

Amodiaquine, Chloroquine, Chlorproguanil, Halofantrine, Mefloquine, Proguanil, Pyrimethamine, Quinine Sulphate. Anti-Migraine Agents: Dihydroergotamine Mesyiate, Ergotamine Tartrate, Methysergide Maleate, Pizotifen Maleate, Sumatriptan Succinate.

**Anti-Neoplastic Agents And Immunosuppressants**

Aminoglutethimide, Amsacrine, Azathiopnne, Busulphan, Chlorambucil, Cyclosporin, Dacarbazine, Estramustine, Etoposide, Lomustine, Melphalan, Mercaptopurine, Methotrexate, Mitomycin, Mitotane, Mitozantrone, Procarbazine, Tamoxifen Citrate, Testolactone.

**Anti Protozoal Agent**

Benznidazole, Clioquinol, Decoquinate, Diiodohydroxyquinoline, Diloxanide Furoate, Dinitolmide, Furzolidone, Metronidazole, Nimorazole, Nitrofurazone, Omidazole, Tinidazole.

**Diuretics**

Acetazolarnide, Amiloride, Bendrofluazide, Bumetanide, Chlorothiazide, Chlorthalidone, Ethacrynic Acid, Frusemide, Metolazone, Spironolactone, Triamterene.

**Anti-Parkinsonian Agents**

Bromocriptine Mesylate, Lysuride Maleate.

**Gastro-Intestinal Agents**

Bisacodyi, Cimetidine, Cisapride, Diphenoxylate, Domperidone, Famotidine, Loperamide, Mesalazine, Nizatidine, Omeprazole, Ondansetron, Ranitidine, Sulphasaiazine.

**Nitrates And Other Anti-Anginal Agents**

Amyl Nitrate, Glyceryl Trinitrate, Isosorbide Dinitrate, Isosorbide Mononitrate, Pentaerythritol Tetranitrate[7].

**EVALUATION OF GRANULES**

**Angle of Repose (θ)**

The friction forces in a loose powder can be measured by the angle of repose (θ). It is anindicative of the flow properties of the powder. It is defined as maximum angle possible between the surface of the pile of powder and the horizontal plane

$$\tan(\theta) = h / r$$

$$\theta = \tan^{-1}(h / r)$$

Where, θ is the angle of repose.

h is the height in cms

r is the radius in cms.

The powder mixture was allowed to flow through the funnel fixed to a stand at definite height (h).The angle of repose was then calculated by measuring the height and radius of the heap of powder formed. Care was taken to see that the powder particles slip and roll over each other through the sides of the funnel. Relationship between angle of repose and powder flow property. Angle of Repose and Type of flow is shown in Table 2.

**Bulk Density**

The bulk density of a powder primarily depends on particle size distribution, particle shape and the tendency of particles to adhere together. Bulk density is very important in the size of containers needed for handling, shipping, and storage of raw material and blend. It is also important in size blending equipment. A standard procedure used for obtaining bulk density or its reciprocal bulkiness is given, below

A sample of about 50 $cm^3$ (blend) is carefully introduced in a 100ml graduated cylinder. The cylinder is dropped onto a hard wood surface three times from a height of 1 inch at two second interval. The bulk density is then obtained by dividing the weight of sample in gms by final volume in $cm^3$.

$$P^b = M / V$$

Where $p^b$ = Bulk Density

M = Weight of sample in gm

V = Final volume of blend in $cm^3$

**Carr's index (or) % compressibility**

It indicates powder flow properties. It is expressed in percentage and is give

$$[(Dt - Db)/Dt] \times 100$$

Where, Dt is the tapped density of the powder and

Db is the bulk density of the powder.

The % compressibility and Flow ability is shown in Table 3.

**Hausner ratio**

Hausner ratio is an indirect index of ease of powder flow. It is calculated by the following formula.

**Hausner ratio = Dt/Db**

Where, Dt is the tapped density.

Db is the bulk density.

Lower hausner ratio (<1.25) indicates better flow properties than higher ones (>1.25).

**Bulkiness**

Specific bulk volume or reciprocal of bulk density is called bulkiness or bulk. Bulkiness increases with a decrease in particle size. In mixture of material of different sizes, however the smaller particle shifts between the larger particles and tends to reduce the bulkiness.

The bulkiness can be calculated by the following formula

**Bulkiness = I/ $p_b$**

where, $p_b$ = Bulk Density.

Loose bulk density

It is defined as the ratio of weight of blend in gms to the loose bulk volume (untapped volume) in $cm^3$ Loose bulk density is given by

Loose bulk density $p_u$ = Weight in gms / V b

Where $V_b$ = Bulk volume (untapped volume)

**Void Volume**

The volume of the spaces is known as the void volume "v" and is given by the formula

**V=Vb-Vp**

Where, Vb = Bulk volume (volnme_before tapping)

V = True volume (volume after tapping)

**Porosity**

The porosity € of powder is defined as the ratio of void volume to the bulk volume of the packaging.

The porosity of the powder is given by

**€= Vb - Vp/ Vp =1- Vp/Vb**

Porosity is frequently expressed in percentage and is given as

**%€ = (1 - Vp/ Vb) X 100**

The porosity of powder indicates the types of packaging a powder undergoes when subject to vibrations, when stored, or in tablet machine when passed through hopper or feed frame.

**Percent Compressibility**

It is an important measure obtained from bulk density and is defined as,

**C = ( Pb-Pu/Pb) x100**

If the bed of particles is more compressible the blend will be less flowable and flowing materials[8-10].

**EVALUATION OF MOUTH DISSOLVING TABLET**

Tablets from all the formulation were subjected to following quality control test.

**General Appearance**

The general appearance of a tablet, its visual identity and over all "elegance" is essential for consumer acceptance. Include in are tablet's size, shape, colour, presence or absence of an odour, taste, surface texture, physical flaws and consistency and legibility of any identifying marking.

**Size and Shape**

The size and shape of the tablet can be dimensionally described, monitored and controlled.

**Tablet thickness**

Tablet thickness is an important characteristic in reproducing appearance and also in counting by using filling equipment. Some filling equipment utilizes the uniform thickness of the tablets as a counting mechanism. Ten tablets were taken and their thickness was recorded using micrometer.

**Uniformity of weight**

I.P. procedure for uniformity of weight was followed, twenty tablets were taken and their weight was determined individually and collectively on a digital weighing balance. The average weight of one tablet was determined from the collective weight. The weight variation test would be a satisfactory method of determining the drug content uniformity. The average weight of tablets and maximum percentage allowed are given in Table 4.

**Tablet hardness**

Hardness of tablet is defined as the force applied across the diameter of the tablet in the order to break the tablet. The resistance of the tablet to chipping, abrasion or breakage under condition of storage transformation and handling before usage depends on its hardness. Hardness of the tablet of each formulation was determined using Monsato Hardness tester.

**Friability**

It is measured of mechanical strength of tablets. Roche fribaiator was used to determine the friability by following procedure. A preweighed tablet was placed in the fribaiator. Fribaiator consist of a plastic-chamber that revolves at 25 rpm, dropping those tablets at a distance of 6 inches with each revolution. The tablets were rotated in the friabalator for at least 4 minutes. At the end of test tablets were dusied and reweighed, the loss in the weight of tablet is the measure of friability and is expressed in percentage as

**% Friability = loss in weight / Initial weight x 100**

***In Vivo* Disintegration test**

The test was carried out on 6 tablets using the apparatus specified in I.P.-1996 distilled water at 37ºC ± 2ºC was used as a disintegration media and the time in second taken for complete disintegration of the tablet with no

palable mass remaining in the apparatus was measured in seconds.

**Wetting time**

The method reported by yunixia et al., was followed to measure tablet wetting time. A piece of tissue paper (12 cm X 10.75 cm) folded twice was placed in a small petridish (ID = 6.5 cm) containing 6 ml of Sorenson's buffer pH 6.8. A tablet was put on the paper, and the time for complete wetting was measured. Three trials for each batch and the standard deviation was also determined.

***In vitro* dispersion time**

*In vitro* dispersion time was measured by dropping a tablet in a beaker containing 50 ml of Sorenson's buffer pH 6.8. Three tablets from each formulation were randomly selected and *in vitro* dispersion time was performed.

**Stability testing of drug (temperature dependent stability studies)**

The Mouth dissolving tablets are packed in suitable packaging and stored under the following conditions for a period as prescribed by ICH guidelines for accelerated studies.

(i) 40 ± 1 °C
(ii) 50 ± 1°c
(iii)37 ±1 ° C and RH 75% ± 5%

The tablets were withdrawn after a period of 15 days and analyzed for physical characterization (Visual defects, Hardness, Friability, Disintegrations, Dissolution etc.) and drug content. The data obtained is fitted into first order equations to determine the kinetics of degradation. Accelerated stability data are plotting according Arrhenius equation to determine the shelf life at 25 ° C[11, 12].

**Packaging**

Expensive packaging, specific processing, and special care are required during manufacturing and storage to protect the dosage of other fast-dissolving dosage forms. Unlike these other quick-dispersing and/or dissolving oral delivery systems, the system can be packaged using various options, such as single pouch, blister card with multiple units, multiple-unit dispenser, and continuous roll dispenser, depending on the application and marketing objectives. List of Marketed Mouth Dissolving Tablets are shown in **Table No. 5.**

**CONCLUSION**

Mouth dissolving tablets constitute an innovative dosage form, which overcomes the problem of swallowing and provides a quick onset of action. The pediatric and geriatric populations are the primary. Targets, as both the groups found it difficult to swallow conventional tablets. The basic approach followed by all the currently available technologies engaged in the formulation of Fast dissolving tablets is to maximize the porous structure of the tablet matrix and incorporate super disintegrating agents in optimum concentration so as to achieve rapid disintegration and instantaneous dissolution of the tablet along with good taste masking properties and excellent mechanical strength The availability of the various technologies and manifold advantages of Fast dissolving tablets will surely increase its popularity in the near future.

**REFERENCES**


1. Debjit B, Chiranjib B, Margret R. Fast Dissolving Tablet: An Overview. Journal of Chemical and Pharmaceutical Research 2009; 1(1):163-77.
2. Shukla D, Chakraborty S, Singh S, Mishra B Mouth Dissolving Tablets I: An Overview of Formulation Technology. Sci Pharm 2009; 77: 309–26.
3. Chacko1 AJ, Jose1 S,Babu1 N, Michelle1 M. Design and Development of Orodispersible Tablets of Promethazine Theoclate Using Coprocessed Superdisintegrants and Subliming Materials. International Journal of Innovative Pharmaceutical Research 2010; 1(2): 53-56.
4. Pahwa R, Piplani M, Prabodh C., Kaushik D, Nanda S. Orally Disintegrating Tablets-Friendly to Pediatrics and Geriatrics. Scholars Research Library Archives of Applied Science Research 2010; 2 (2): 35-48.
5. Shukla D, Chakraborty S, Singh S, Mishra B. Mouth Dissolving Tablets I: An Overview of Formulation Technology. Sci Pharm 2009; 77: 309–26.
6. Pahwa R, Piplani M, Prabodh C, Kaushik D, Nanda S. Orally Disintegrating Tablets-Friendly to Pediatrics and Geriatrics. Scholars Research Library Archives of Applied Science Research 2010; 2 (2): 35-48.
7. Seager H. Drug-delivery Products and the Zydis Fast-dissolving Dosage Form. J. Pharm. Pharmacol. 1998; 50: 375-82.
8. Khan A, Sharma R, Gupta N. Orally disintegrating tablets: formulation, preparation techniques and evaluation. Journal of Applied Pharmaceutical Science 2011; 01 (04): 35-45.
9. Mehta K, Garala K, Basu B, Joshi1 B, R. Narayana. An Emerging Trend In Oral Drug Delivery Technology: Rapid Disintegrating Tablets. Journal of Pharmaceutical Science and Technology 2010; Vol. 2 (10):318-29.
10. M. Swamivelmanickam, R. Manavalan and K. Valliappan. Mouth Dissolving Tablets: An Overview International Journal of Pharmaceutical Sciences and Research 2010; Vol. 1 (12): 43-55.
11. Kumari S, Visht S, Sharma P, Yadav R. Fast dissolving Drug delivery system, Review Article Journal of Pharmacy Research 2010; 3(6):1444-49.
12. Chacko1 AJ, Jose1 S, Babu1 N, Michelle1 M. Design Development of Orodispersible Tablets of Promethazine Theoclate Using Coprocessed Superdisintegrants and Subliming Materials. International Journal of Innovative Pharmaceutical Research.2010; 1(2): 53-56 .

**Table 1: List of Superdisintegrants**

| Superdisintegrants | Example |
|---|---|
| Crosscarmellose®<br>Ac-Di-Sol®<br>Nymce ZSX®<br>Primellose®Solutab® | Crosslinked<br>Cellulose |
| Crosspovidone<br>Crosspovidon M®<br>Kollidon®<br>Polyplasdone | Crosslinked<br>PVP |
| Sodium starch glycolate<br>Explotab®<br>Primogel | Crosslinked<br>Starch |
| Soy polysaccharides<br>Emcosoy | Natural super<br>Disintegrant |
| Alginic acid NF<br>Satialgine | Crosslinked<br>alginic acid |

**Table 2: Angle of Repose**

| Sr. No. | Angle of Repose (°) | Type of Flow |
|---|---|---|
| 1 | < 20 | Excellent |
| 2 | 20 – 30 | Good |
| 3 | 30 – 34 | Passable |
| 4 | > 34 | Very Poor |

**Table 3: % Compressibility**

| Sr. No. | % compressibility | Flow ability |
|---|---|---|
| 1 | 5 – 12 | Excellent |
| 2 | 12 – 16 | Good |
| 3 | 18 – 21 | Fair Passable |
| 4 | 23 – 35 | Poor |
| 5 | 33 – 38 | Very Poor |
| 6 | < 40 | Very Very Poor |

**Table 4: Uniformity of Weight**

| Average weight of Tablets (mg) | Maximum percentage allowed |
|---|---|
| 130 or | 10 |
| 130-324 | 7.5 |
| More than 324 | 5 |

**Table 5: Marketed Fast Dissolving Tablets in India**

| Name of the Product | Active Ingredients |
|---|---|
| Imodium Lingual | Imodium |
| Pepcidin Rapitab | Pepcid |
| Mosid – MT | Mosapride citrate. |
| Calritin Reditabs | Immediate Dissolving formulation of Calritin |
| Nimulid – MD | Nimesulide |
| Zyrof Meltab | Rofecoxib |
| Claritin Reditab | Micronized loratadine |
| Feldene Melt | piroxicam (10 or 20 mg), |
| Maxalt-MLT | Rizatriptan peppermint flavor |
| Pepcid RPD | famotidine (20 or 40 mg), |
| Zyprexa Zydis | olanzapine (5, 10, 15 or 20 mg), |
| Zofran ODT | ondansetron strawberry flavor |
| Remeron Soltab | Mirtazepine orange flavor |