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PHARMACEUTICAL PELLETS-A FUTURE ASPECT

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ABSTRACT

Compaction of multiparticulate, commonly called MUPS, is one of the more recent and challenging technologies that combine the advantages of both tablets and pellet-filled capsules in one dosage form. Venlafaxine is an anti depressant, having an elimination half-life of 5±2 hrs and its maximum daily dose is 300mg. The objective of the study is to prepare venlafaxine extended release pellets by extrusion spheronization technology, coating them with mixture of rate controlling polymers. Ethyl cellulose desired dissolution pattern and compressing the pellets into tablets.

INTRODUCTION

Definition: The word "pellet" had been used to describe a variety of systematically produced, geometrically defined agglomerates obtained from diverse starting materials utilizing different processing conditions.

Why Pellets?

Pellets have varied applications in a number of industries and an innovative use of its could achieve maximum profitability. Some of the few instances where smooth surfaced uniform pellets are being successfully used highlighted below:

- Improved aesthetic appearance of products.
- Coating of drug pellets with different polymers to achieve controlled release rate of drugs.
- For immediate release products larger surface area of pellets enables better distribution, dissolution and absorption[18].
- Chemically incompatible products can be formulated into pellets and delivered in a single dosage form by encapsulating them[19,20].
- This technique is used to avoid powder dusting in chemical industries.
- Varied applications are possible e.g., Sustained release detergent powder, milkshake pellets.
- Pellets ensure improved flow properties and flexibility in formulation development and manufacture.
- The coating material may be colored with a dye material so that the beads of different coating thickness will be darker in color and distinguishable from those having fewer coats and the beads or granules of different thickness of coatings are blended together in the desired proportions to give the desired effect.

The thickness of the coat over the drug pellets ensures the rate at which the drug/contents are released from the coated particles. A smooth surface of the pellet provides uniform coating thickness on each pellet and it is effective in dosage form development.

*** Mechanism of pellet formation and growth**

(Method of preparation of pellets)

There are number of procedures to evaluate and various theoretical and mathematical expressions designed to explain the strength of pellets, mechanism of pellet formation and growth and the fundamental bonding forces that determine the strength of pellets during any pelletization process.

1 Bonding forces

1.a Attraction between solid particles

1.b Interfacial forces and capillary pressure in movable liquid surfaces

1.cAdhesional and Cohesional forces

1.d Solid bridges

1.e Mechanical Interlocking

2. Elementary growth mechanisms

2.a Nucleation

2.b Coalescence

2.c Layering

2.d Abrasion transfer

2.e Size reduction

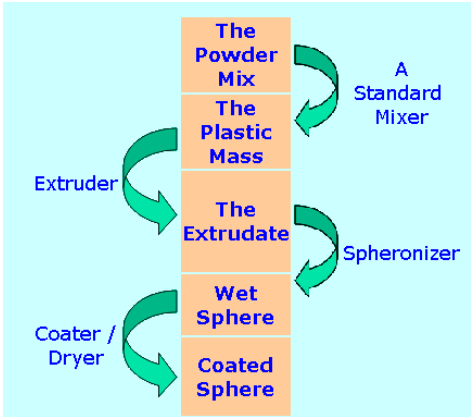
3 .Pellet formation and growth

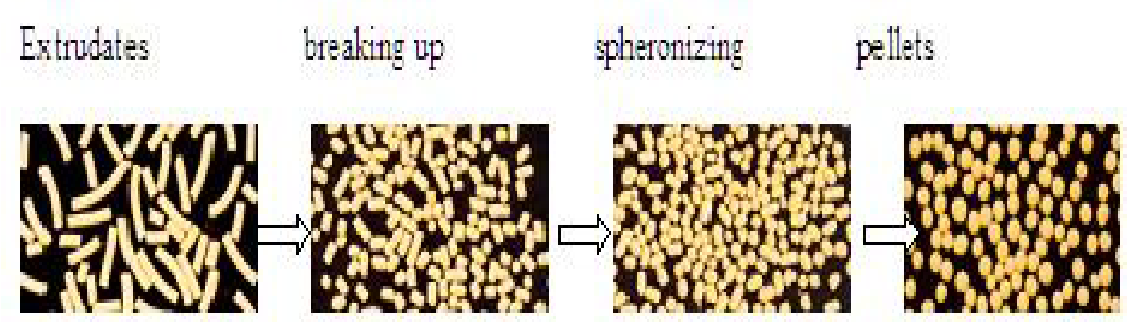
3.a Balling

3.b Drug Layering

3.c Compaction (Extrusion-Spheronization)

3.dGlobulation





Formulation of tablets

1. Preparation of pellets
   a.sub coatingCambria
   b.granular part
   c.extra granular part
2. coating of pellets
3. preparation of tablet
4. 4.Compression of tablet:

APPLICATION:

1.Taste masking: Although various technique have been utilized to mask the bitter taste of a drug such as the addition of sweetners and flavours, filling in capsules, coating with water insoluble polymers or pH dependent soluble polymers, complexing with ion-exchange resins, microencapsulation with various polymers, compelxing with cyclodextrins and chemical modifications such as the use of insoluble prodrugs, few reports have described the masking of unpleasant taste without lowering of bioavailability especially for oral products

2. Immediate release: Administering drugs in pellet form leads to an increased surface area as compared to traditional compressed tablets and capsules. Thiswould
considerably reduce the time required for disintegration and have the potential for use in rapidly dispersible tablets.

3 Sustained release: Pellets are being increasingly used in the manufacture of sustained release dosage form of drugs

REVIERW LITRATURE

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CONCLUSION

On the basis of the present results, the following conclusions can be drawn:

1. The centrifugal granulating process is a convenient method of manufacturing microcrystalline cellulose (MCC) initial beads (substrates). As regards process related advantages and limitations, the formulation with MCC 90M as a seed material and MCC 50M as a filler seems to be more acceptable than the other ones.

2. Nucleation, coalescence, abrasion transfer and layering are the major mechanisms of the formation and growth of MCC beads in the centrifugal granulating technique.

3. The selection of binder for use in preparing drug-layered pellets in the centrifugal granulating process should be made with care. With povidone (Plasdone K-29/32) and maltodextrins (Maltrin M100 and M040) as aqueous binders, satisfactory drug-layered pellets based on MCC initial beads can be prepared. Binder concentration and bead size are critical material variables in processing the pellets. MCC initial beads of a larger size and a binder concentration as low as possible should be chosen for better reproducibility

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