

POWDER

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INTRODUCTION

The term 'Powder' may be used to describe:

The physical form of a material, that is, a dry substance composed of finely divided particles.

Or, it may be used to describe a type of pharmaceutical preparation, that is, a medicated powder intended for:

1. internal (i.e., oral powder)
2. external (i.e., topical powder) use.



DEFINITION

Pharmaceutical Powders are intimate mixtures of dry, finely divided drugs and/ or chemicals that may be intended for internal (oral powders) or external (topical or dusting powder) use.



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Powders represent one of the oldest dosage forms. It is a preparation in which drug is blended with other powdered substances and used for internal or external purpose. Powder as a dosage form permits drugs to be reduced to a very fine state of division, which often enhances their therapeutic activity or efficacy by an increase of dissolution rate and/ or absorption. Divided powders are also found to be convenient for administering drugs that are excessively bitter, nauseous, or otherwise to the taste.

ADVANTAGES

- ✓ Powders being the solid preparation are more stable than liquid and semi-solid preparations.
- ✓ Convenient forms, to dispense large dose of drugs. They can be best administered in powder form by mixing them with food or drinks.
- ✓ Since powders are in the form of small particles they offer a large surface area and are rapidly dissolved in the gastrointestinal tract minimizing the problems of local irritation.



Cont..

- ✓ More convenient to swallow, faster dissolution and absorption than tablets or capsules.
- ✓ Powders offer a lot of flexibility in compounding or incompatible solids and possess good chemical stability .
- ✓ They are easy to apply.



DISADVANTAGES

- ✓ Less convenient to carry especially for bulk powders are not suitable for administering potent drugs with a low dose.
- ✓ Difficult to mask the unpleasant taste of the drugs.
- ✓ Light fluffy powders may be inhaled by infants leading to breathing difficulties.
- ✓ Variable dose accuracy



CONT.

- ✓ Not suitable form for drug inactivated in the stomach or cause damage to stomach these should be presented as enteric-coated tablets.
- ✓ Not suitable for bitter, nauseating and corrosive drugs, if are meant for oral administration.
- ✓ Difficulty of protecting hygroscopic , deliquescent or aromatic materials and not suitable for drugs which are unstable in normal atmospheric conditions.



CLASSIFICATION

They are broadly classified in three classes

1. Bulk powders for external use: (a) Dusting powders
(b) Snuffs (c) Dental powder (d) Insufflations
2. Bulk powders for internal use.
3. Simple and compound powders for internal use.
4. Effervescent granules
5. Eutectic mixtures
6. Cachets



TABLET TRITURATES

They are prepared by moulding powder into tablets. They are flat and circular disk shaped. Usually they are prepared for potent medicaments and highly toxic drugs by diluting with diluents like lactose, dextrose sucrose etc. the drug and the diluents are mixed and the moistened with suitable dilution of alcohol (usually 50-60% alcohol is used) and mixed and then as to get a damp mass. This damp mass is filled in the perforations of the mould with a spatula. The excess amount damp mass is squeezed with the edge of the spatula.



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The filled perforated plate is superimposed on another plate having the same number of projecting pegs as that perforation. A little pressure is put over the upper plate which will allow the plate to go downward leaving the moulded tablets on the top of the pegs. These moulded tablets are carefully spread on the clean surface and dried either in open air or in oven at a controlled temperature.



METHOD OF PREPARATION

Official preparations-

Simple powders- Simple powders only one ingredient either in crystalline or amorphous form. These powders should preferable be reduced to fine powder, weighed properly and supplied in a single dose packet separately. The wrapping of powders may be single wrapped or double wrapped (lined with waxed paper) according to the properties of the drugs. If the drug is resistant to atmospheric conditions, it can be wrapped singly and if sensitive to those conditions, must be double wrapped



For example:

Rx

Paracetamol ...500mg

Method: Weigh accurately the required amount of paracetamol powder which is already in its fine state. If not, then first reduce to fine powder and weigh. Wrap each dose in a white demy paper



Compound powders

Compound powders contain two or more ingredients supplied in the form of fine state of powder in divided dose, i.e. each dose is supplied in a single packet.



For example:

Rx

Aspirin	250mg
Paracetamol	150mg
Caffeine	50mg

Method: Powder each ingredient and weigh required quantities. Mix them in geometrical proportional and supply in divided doses. Wrap each dose in a doublewrapped paper.

Preparation of powders Step

Step (1) Particle size reduction:

- For the preparation of powder, each ingredient should be needed in finely ground form; hence manufacture must use a number of procedures and equipment to reduce the particle size of powder ingredients, this process is called as comminution.
- The most common method used for particle size reduction is powder formulation is trituration, which involves placing the solid in a mortar and continually grinding the chemical between the mortar and the pestle using a firm, downward pressure.

Cont..

- The powder must be frequently scraped from the sides of the mortar to ensure that all particles are evenly reduced and mixed.
- A levigating agent, such as glycerin, may be added to the solid and processed by either continued trituration or by placing the mixture on an ointment slab and using spatulation to wet the solid and further reduce the particle size of a powder after it has been triturated.



In laboratory scale

- ❖ Trituration,

- ❖ Pulverization and

- ❖ Levigation



In industrial scale

- ❖ Bowl chopper,
- ❖ Hammer mill,
- ❖ Roller mills,
- ❖ Attrition mill,
- ❖ Colloid mill,
- ❖ Ball mill etc
- ❖ Advance size reduction technologies
- ❖ Microfluidics particle reduction



Step (2) Preparing a homogenous mixture

The powders may be mixed by any one of the following methods:

- ☐ Spatulation,
- ☐ Trituration,
- ☐ Geometric dilution,
- ☐ Sifting and Tumbling

A. SPATULATION



In this method, mixing of powders is done by the movement of a spatula throughout the powders on a sheet of a paper or on a porcelain tile. The method is very useful in mixing a small amount of powder or solid substances that liquefy (eutectic mixtures)