University of Tikrit
College of Pharmacy
Department of Pharmaceutics

Practical Industrial Pharmacy II

Lab 3

Direct Compression Method for Preparation of Tablets

Part 2

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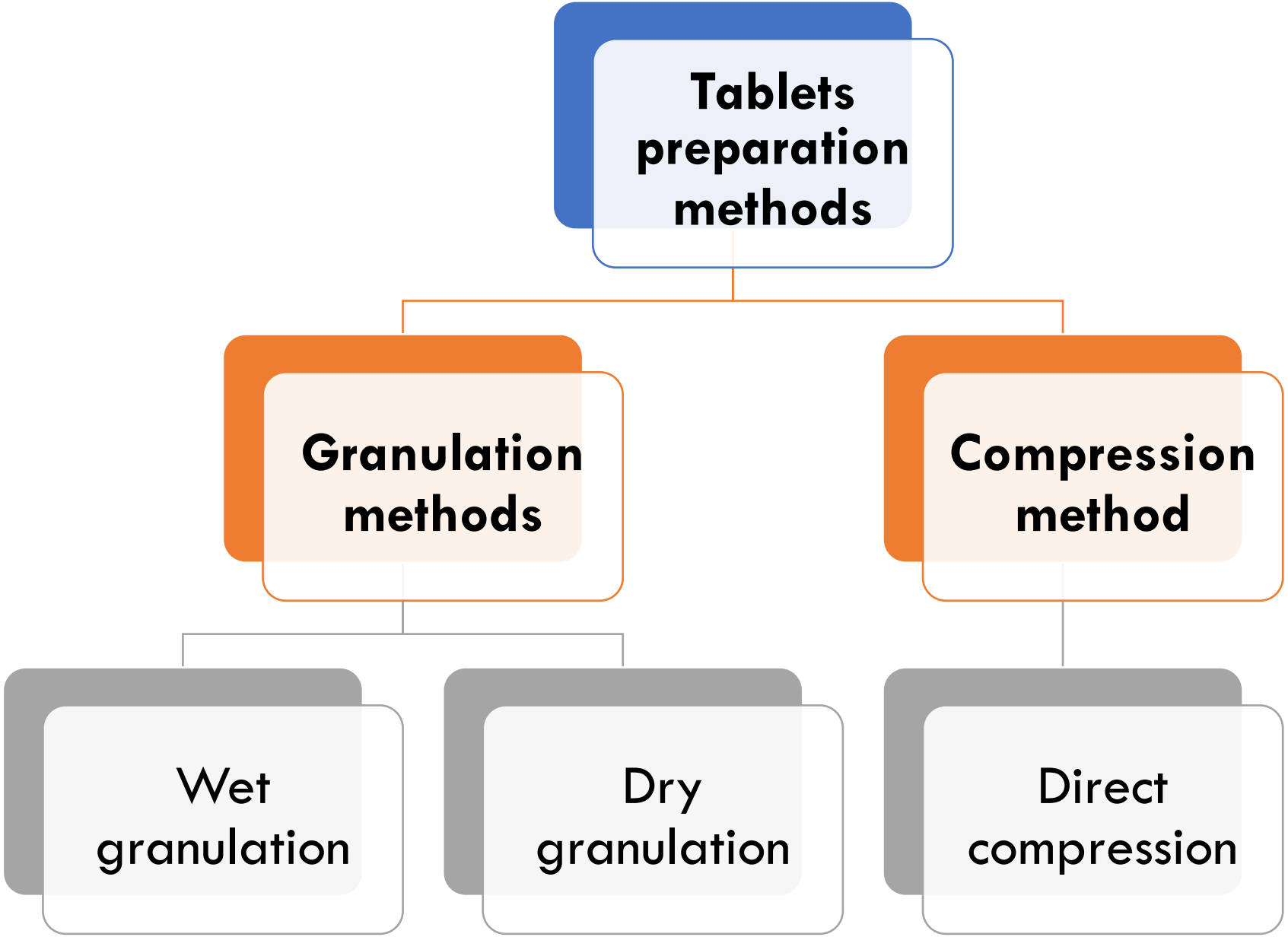


***Note:** Direct compression & dry granulation are called the dry processes while wet granulation is called the wet process.

Direct Compression Method

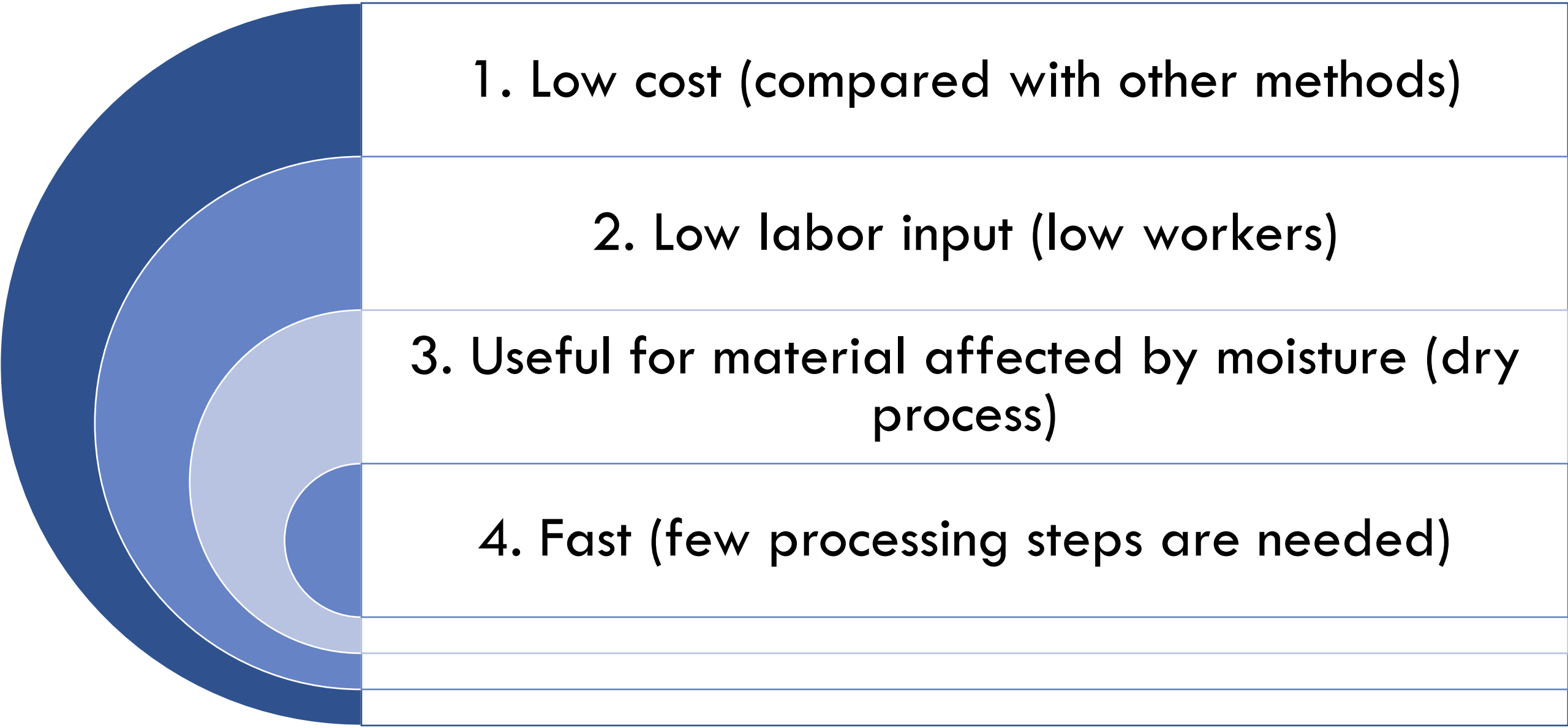
- Compression of tablet directly from powdered materials without modifying the physical nature of the material itself.

- It is used for crystalline material. when we have crystalline structure it is more easily to compress than amorphous form because when applying pressure (force of compression) certain bond called cohesive bond will form between crystals but in amorphous form it is not easily compressed when applying pressure because it is difficult to create such bonds between the particles.

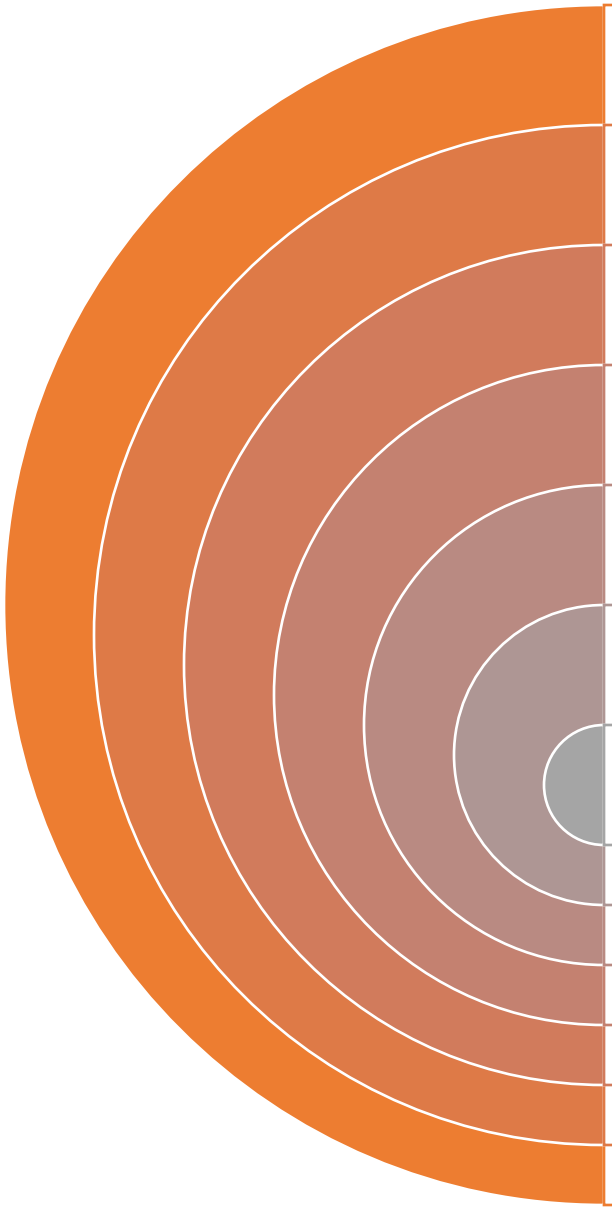
Direct Compression Method

- Therefore, most large doses of drugs are not preferably prepared by this technique (direct compression).
- Moreover, drugs having small doses (like digoxin) can not be compressed directly because a uniformed distribution of the drug in the tablets could not be maintained.
- Hence, this method is usually used for moderate doses only.
- Compression of a drug by itself creates a major problem in the disintegration because: tablet may rupture into small molecules & suffer from melting & take a long time for dissolution.
- So, a disintegrating agent is used to ensure fast disintegration and dissolution.

Advantages of Direct Compression Method

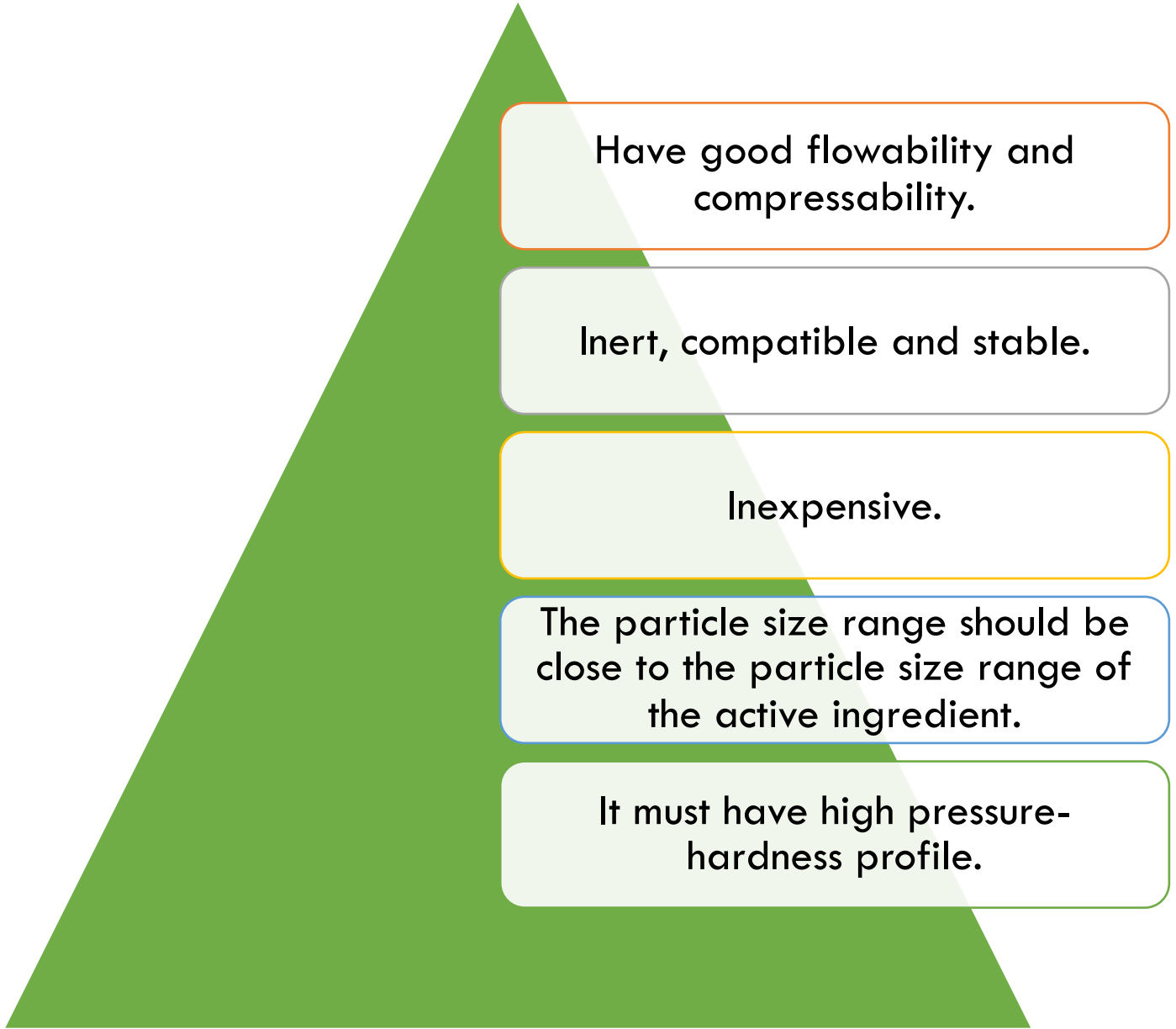


Disadvantages of Direct Compression Method



1. There is limited number of materials having crystalline form.
2. All additives should have good flowability & compressibility.
3. Used only for intermediate dose medications.
4. It has an extended disintegration time → ↓absorption
5. Possible reaction of the excipient with the drug (incompatibility). For example: the reaction of spray dried lactose with amine salts resulting in darkening of the color with aging.
6. Differences in particles' sizes (when we have more than one type of ingredients) → segregation.
7. Because the process is carried in dry condition static charges may exit & result in mixing problems (hindrance of flowability).

Properties of an ideal excipient for direct compression



Formulation of Ferrous Sulfate Tablets

- **Drug:** Ferrous sulfate: 98 mg
- **Diluent:** 250 mg (Lactose)
- **Disintegrant:** 10 mg (Crosspovidone)
- **Binder:** 37 mg (starch)
- **Lubricant:** 2 mg (mg stearate)
- **Glidant:** 0.5 mg (silica or talc)

Procedure

1. Weigh all ingredients and mix them (except lubricant) in a beaker for 5 minutes.

2. Add lubricant and mix for 1 minute

3. Directly compress.