

Microencapsulation

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MICROENCAPSULATION

- Microencapsulation is a technique by which coating can be applied to small particles of solids, droplets of liquid or dispersion thus forming microencapsulation.
- It is different from other coating methods because in that process is used to coat the particles having particle size range from several tenth of a micron to 5000 μ .
- Microencapsulation method based on:
 - ✓ Chemical process (chemical or phase change)
 - ✓ Mechanical process (physical change)

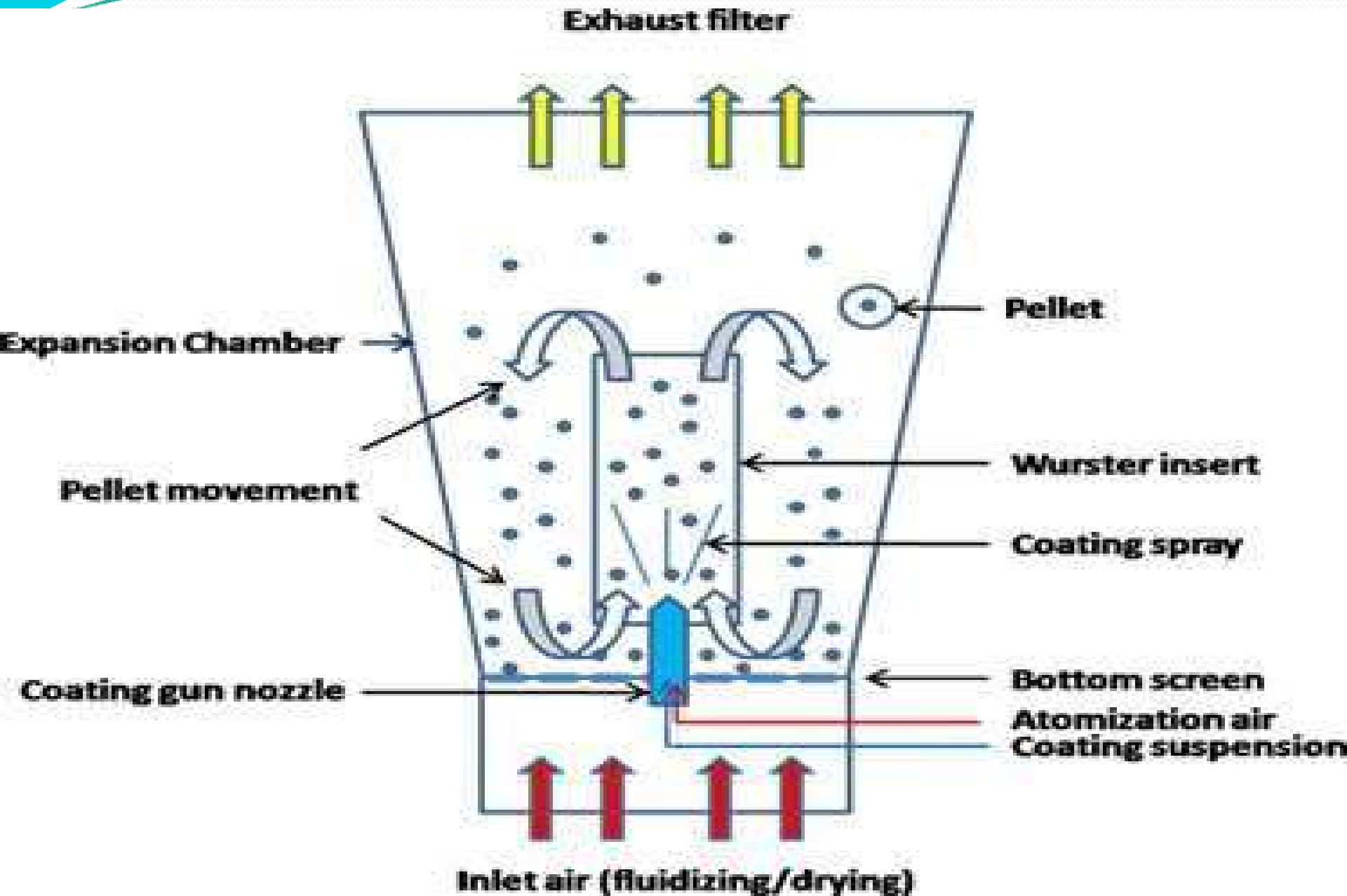
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- Following techniques are used for microencapsulation:
 - ❑ Pan coating
 - ❑ Fluidised bed coating
 - ❑ Coacervation
 - ❑ Electrostatic deposition
 - ❑ Vacuum deposition
 - ❑ Polymerisation
 - ❑ Multiorifice centrifugal process

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- **Pan Coating** : This technique is suitable in those cases where the particle size is larger than 600μ . In that API charged on to spherical pellets of sugar & then coated with coating material in coating pan with hot air is circulated simultaneously in order to speed up the drying process.
- **Fluidised bed coating** : In this method solid materials are suspended with turbulent flow of air in a chamber & coating material is introduced in the chamber with help of nozzles. In this chamber the temp. is controlled in a such way that the volatile organic solvent is vapourised. After cooling, the heavy solid materials or particles fall on the screen near the outlet form where these can be removed.

FLUIDISED BED COATING

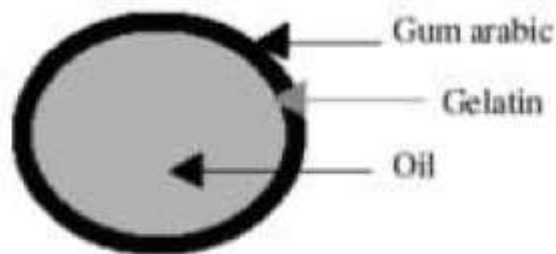
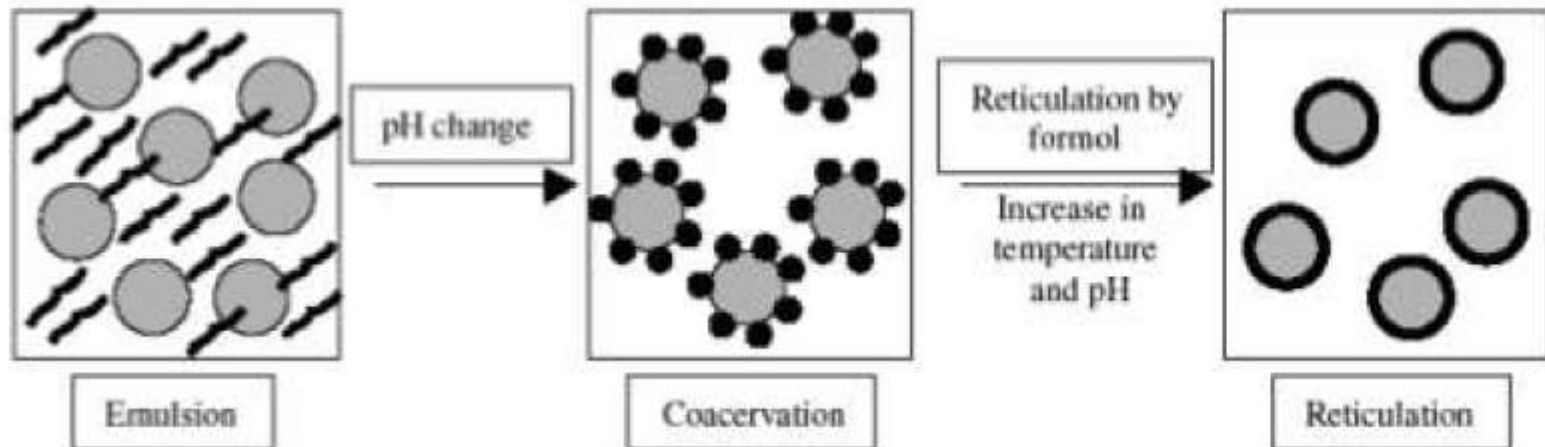


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Coacervation : Coacervation means the separation of a liquid or phase when solution of two hydrophilic colloids are mixed under suitable conditions.

- In this method, the three immiscible phases of core material, solvent and coating material are formed followed by deposition of coating material on the core.
- The coating material is dissolved in a suitable solvent and the core material is uniformly dispersed in the solution of the coating material.
- Then the coating material is phased out of its solution which starts getting deposited on the particles of the core material.

Coacervation Formation



Electrostatic deposition :

- The method is useful both for solid particles and liquid droplets.
- In this process, the core and coating materials are electrically charged by means of high voltage such as 10,000 volts etc.
- The core is charged and placed in the coating chamber.
- The coating material is also charged before it is sprayed as a mist.
- Because the charges are of opposite kind, the coating material gets deposited on the core due to electrostatic attraction.

Vacuum Deposition : In that technique the coating material gets deposited on the core particles & coating material is vaporized under vacuum.

- **Polymerisation** : This is a new technique. In that technique core material is dispersed in a liquid or gas in which monomeric units of the coating material are present. These monomers get polymerised at the interface between core particles & the liquid gas phase which forms coat over the core.
- **Multiorifice centrifugal process** : In that process the particles of the core material are forced through an envelop of coating material in solution by centrifugal force.

Advantages:

- Mask the taste of bitter drug.
- It is used in formation of sustained release dosage form.
- It is used to separate an incompatible material.
- Used to protect drug from moisture & oxidation.

Thank you!