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Pharmaceutical preformulation studies of the drug and prefoemulation parameters

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ABSTRACT:

This article highlights the importance of Preformulation studies in pharmaceutical research. It discusses parameters such as solubility, pH, density, and compressibility, emphasizing their role in new drug development and quality assurance. Challenges and advantages of Preformulation studies are outlined, underscoring their significance in optimizing drug formulations for enhanced efficacy and safety.

Key words : preformation studies, solubility analysis, determination of density, compressibility, flow properties of powder.

Introduction :

In daily life style we are using lots of medicine for the health, but the question is how is it not proper formulate, sweet can hum to your body, so we discuss about the topic of preformation studies of the drug. In which we study the various parameters to use in the Preformulation studies. For example, solubility analysis, determination of PH, density, compressibility, organoleptic properties etc.

Advantages of preformation studies:

- Preformulation study help to new drug development and evolution of the drug.
- Enhancement of the public safety.
- Give the quality product.
- Aid in Adopting new technology

Disadvantages of Preformulation studies:

- Resistance due to spherical particle shaped inaccurate.
- The needle shape crystals may block opening.
- Difficult the compound dissolution in water.
- In the suspension particle are unevenly settling.

Preformulation parameters:

Organoleptic properties:

Here, the original electric properties contain the test ,order and colour of the drug.

Colour:

- Keep record for the production of drug.
- Adding different colour to the body is okay if the colour is not good.

Odour and taste :

- Use less soluble form of the drug or mask it with flavours sporting etc.
- handle the skin irritation substances with care.
- Using the flavour die and excipients impact the stability and bioavailability of the drug.
- It's colour might be of white cream yellow tan or shiny.
- Orders can be sulphurous, fruity, aromatic, pungent, odourless etc.
- test can be acidic, bitter, bland sweet, intense, tasteless etc.

solubility analysis :

Solubility analysis is the process of determination of the how much substance can dissolve in the given solvent under the specific condition. Preparing solution for the substance, allowing them to reach equilibrium, measuring the amount dissolved and sometime varying the temperature to see how solubility changes. This help to understand how formulation behave in solutions, aiding in formulation, drug design and quality control.

Determination of PH:

Edit termination of PH studies is understand how drug substance behave under the different pH condition. It help to formulate the new drug product. Various methods can be used to measure pH including pH meter pH indicators etc.

PH meter:

It is the most common methods for the determination of PH. A pH meter major the concentration of hydrogen in solution. In this method a small amount of a drug is dissolved into the water, and pH metre direct to use to measure the pH of the solution.

pH indicator:

In this method we used different indicators that changes colour at different pH level. A drug bhi are dissolve into water and few drops of dye are added. The colour change is compare with the standard chart of the pH .

Determination of density:

There are many two types of the density :

1) bulk density
2) Tapped density

1)bulk density :

bulk density shows the mass of bulk material such as powder, granules etc.
Here, how find out the bulk density is following these formula:
Bulk density =mass(m)/volume (v)

2)tapped density:

When the Powder and granules have space between particle, so tapped density used to compress the space. However, due to the particles settle down together. In this procedure in the container add the Powder and tapped it for 100 time to get tapped density.
We can determine tapped density using this formula:
Tapped density =weight of material/ volume of the container

The properties of powder flow:

It is the most important properties of the Powder in which we determine the flow properties of the powder or a granules using angle of repose.

What is angle of repose ?

Angle of repose is the maximum angle at which the power material remains stable without slumping. It is the important parameter for powder to characterized the flow properties of the Powder.
Angle of repose determine by using this formula;
Tan theta =2h/d
Where,
H=height of pile of surface.
D=diameter of circle.

Angle of repose	Flowability
• 25-30	• Excellent
• 31-35	• Good
• 36-45	• Fair-passable
• 46-55	• Poor
• 56-65	• Very poor
• >66	• Very, very poor

Compressibility:

The Powder material refers to the ability of material to decrease in volume of the force applied on subjects. It's an important properties or parameters to affect the behaviour of these materials during handling, processing and storage.
Carr's index and hausner's ratio are two men important parameters. Used to quantify the compressibility of the Powder substance. Parameters used to provide the flow properties of the materials.

Carr's index:

The carr's index is determine the compressibility of the given powder material.
We can determine using the formula;
Carr's index=(tapped density -bulk density/tapped density)×100

Hausner's ratio:

The hausner's ratio determine the flow ability anti compressibility of a powder.
It can determine using these formula;
Hausner's ratio= tapped density/ bulk density

Conclusion:

Preformation method is provide the selection of API and changes into them to modify the drug. After all testes of the Preformulation study it will be go for further clinical trial and animal trials. Preformulation study helps to the new drug development and overcome of the adverse effect of the drug.

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