



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## A REVIEW: DRUG SOLUBILITY

<sup>1</sup>Shubham D.Kadam, <sup>2</sup>Sushil.A. Baste, <sup>3</sup>Om.Y.Shinde, <sup>4</sup>Shweta M.Raundal, <sup>5</sup>Neha Kothawade

<sup>1</sup>Author, <sup>2</sup>Author, <sup>3</sup>Author, <sup>4</sup>Author, <sup>5</sup>Assistant professor

<sup>1</sup>DEPARTMENT OF PHARMACEUTICS

<sup>1</sup>DR.BABASAHEB AMBEDKAR TECHNOLOGY RAIGAD,INDIA UNIVERSITY,LONERE.

### Abstract:

*Solubility that is one that relates with the dissolution is a terribly vital factors that relates with the medicine action of a drug. This is as a result of it is to deliver the goods the lowest or desired concentration in the blood circulation for a drug to provide its medicine effects. Quite four-hundredth new chemical entities area unit found to be insoluble in water. The solubility of the active ingredients of the medication is then be the main issues for the researchers lately. Therefore, there area unit a couple of techniques that we are able to use to enhance the solubility of the medication like particle size reduction. Dissolution is additionally vital for medication to be absorbed into the blood circulation. Therefore, for oral taken medication, sometimes dissolution testing is required to possess a more robust management of the product's activity throughout its life cycle.*

**INDEX TERM:** Solubility,drug ,dosage form,bioavailability,absorption

### I.INTRODUCTION:

Solubility is that the property of a solid, liquid, or gassy chemical substance referred to as matter to dissolve during a solid, liquid, or foamy solvent to create a uniform answer of the matter within the solvent. The solubility of a substance basically depends on the solvent used yet as on temperature and pressure. The extent of solubility of a substance during a specific solvent is measured because the saturation concentration wherever adding additional matter doesn't increase its concentration within the answer.

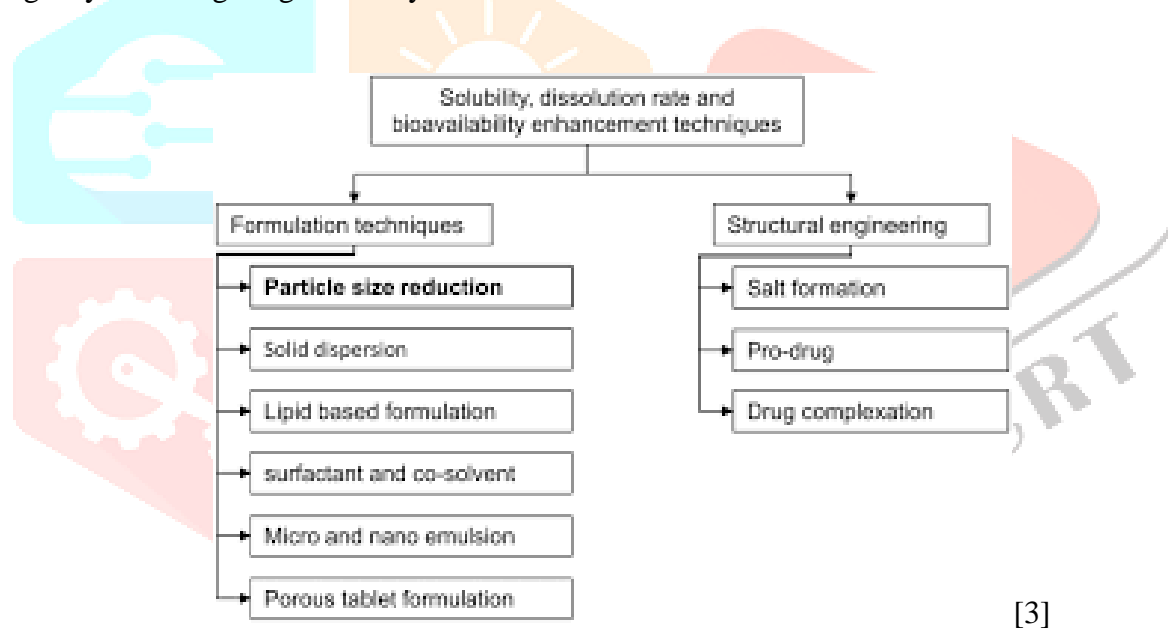
The solvent is mostly a liquid, which may be a pure substance or a mix of 2 liquids. One can also speak of primary solid solution, however seldom of answer in an exceedingly gas.The extent of solubility ranges wide, from infinitely soluble (fully miscible) like ethyl alcohol in water, to poorly soluble, like chloride in water. The term insoluble is commonly applied to poorly or terribly poorly soluble compounds.[1]

## II.IMPORTANCE OF SOLUBILITY:

- Therapeutic effectiveness of drug depends upon the bioavailability and ultimately upon the solubility of drug molecules.
- Solubility is one of the important parameter to achieve desired concentration of Drug in systemic circulation for pharmacological response to be shown.[4]

## III.PARTICLE TECHNOLOGIES :A TOOL FOR SOLUBILITY ENHANCEMENT.

Particle technology in medical specialty may be a technique to change chemistry, micrometrics and biopharmaceutical properties of the poorly soluble medicine, thereby rising their solubility. Among varied techniques for solubility improvement, physical modifications of drug product like reducing the particle size and modifying crystal habit area unit common approaches to extend drug solubility . except typical micronizing techniques, particle technology currently deals with varied particle and nanoparticle engineering processes as promising ways of rising drug solubility.



[3]

## IV.FACTOR AFFECTING DRUG SOLUBILITY:

### 1.PH LEVEL:

hydrogen ion concentration measures the quantity of H content during a solution—the a lot of H ions, the lower the hydrogen ion concentration and the other way around. Solutions with sturdy hydrogen ion concentration levels absolutely dissociate and people with weak hydrogen ion concentration levels solely partly dissociate. The pKa worth is one technique wont to live the strength of associate acid. A lower pKa worth means that the drug substance may be a stronger acid, that a lot of totally dissociates in water.

## 2.POLARITY OF DRUG AND SOLVENT :

Ionization is very important for a drug to be soluble for oral drug consumption. additionally, particle housings is very important for the drug to work properly. within the abdomen or intestines, the drug is non-ionized thus it is absorbed. once it enters the blood, it must become ionizing once more to forestall it from going back to the rat and to make sure it's absorbed by the body. lipide soluble substances contain non-ionized molecules (NaCl), and hydrophilic substances contact ionizing molecules (Na<sup>+</sup>, CL<sup>-</sup>), that means the additional lipide soluble a drug is, the a lot of absorpction there'll be. The a lot of water soluble (hydrophilic) a drug is less than absorpction there is .

## 3. DRUG PARTICLE SIZE :

The solubility of a drug is directly tied to the particle size. Typically, larger particles area unit less soluble, particularly if the temperature, pressure and polarity for the solutes is that the same. the power for a drug to be soluble permits for straightforward diffusion of the drug with no energy or carrier macromolecule required to enter and be absorbed by the blood.

## 4.SOLUTION PROCESS:

Most substances square measure heat-absorbing, or absorb heat within the method of dissolution, that means a rise in temperature from room-temperature storage to oral consumption and getting into body heat leads to a rise in solubility. additionally to temperature, agitation helps increase the speed at that the drug dissolves.

## 5.TEMPERATURE:

The stability of a medicinal substance is affected by changes in temperature when the temperature is increased ,it causes an increase in the hydrolysis rate of drug.

## 6.MOISTURE:

Some physical and chemical dosage changes when the water soluble solid drug dose is suck up into any moisture surface and therefore loses its stability.

## 7.EXCIPIENTS:

Starch and povidone excipients have higher water content and affect stability by improving the formulations of water content .

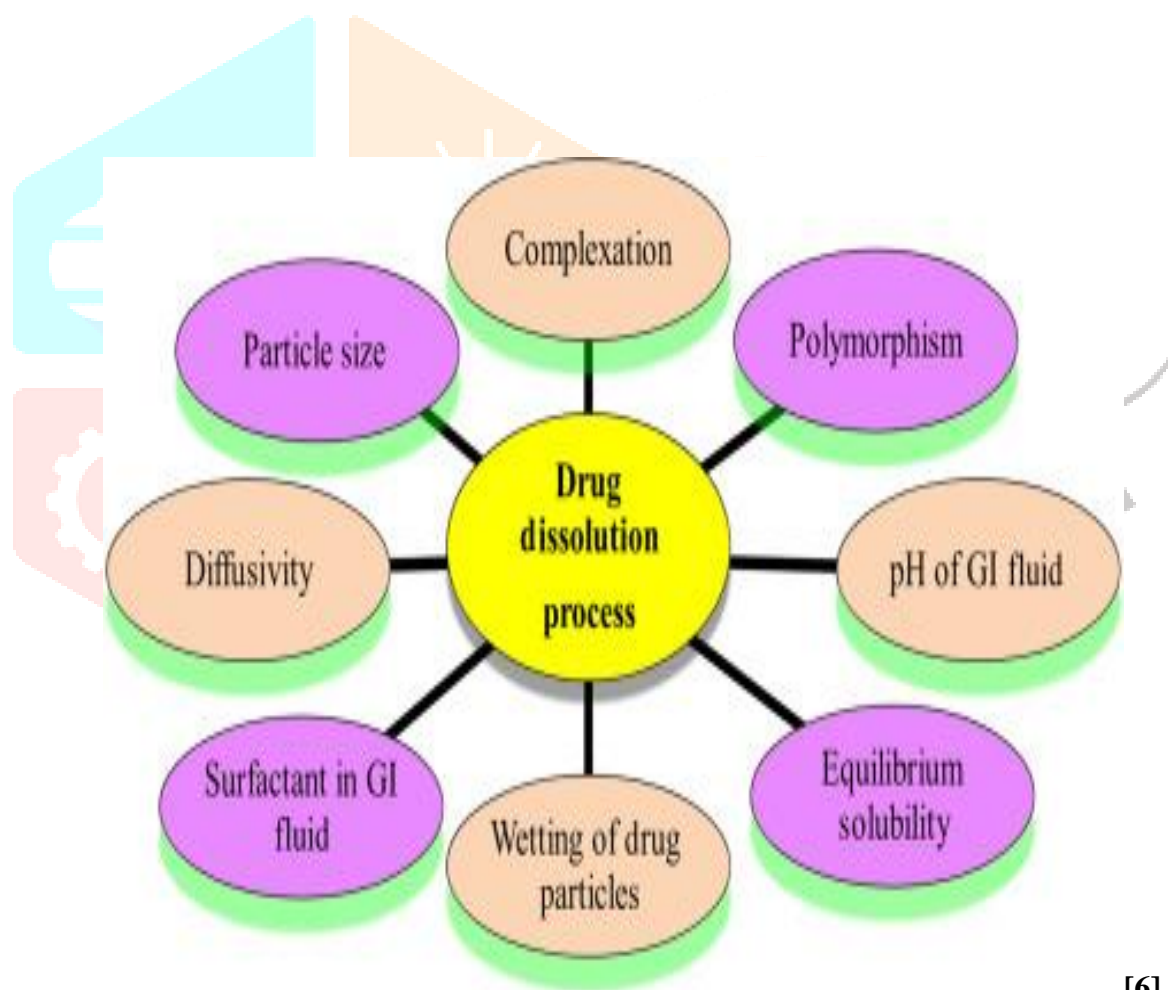
## 8.OXYGEN:

Oxygen presence facilitates oxidation in some drug products .products with a greater decomposition rate are stabilized when exposed to oxygen by altering carbon dioxide and nitrogen for oxygen in the storage container.

## 9.LIGHT:

When exposed to light the rate of degradation increases . some drug are photophobic rate their stability can be measured when exposed to light or stored in the dark by comparing their stability photosensitivity drugs must be packed in a glass amber bottle and help in a dark place.[1],[2]

## V.DRUG DISSOLUTION PROCESS:



[6]

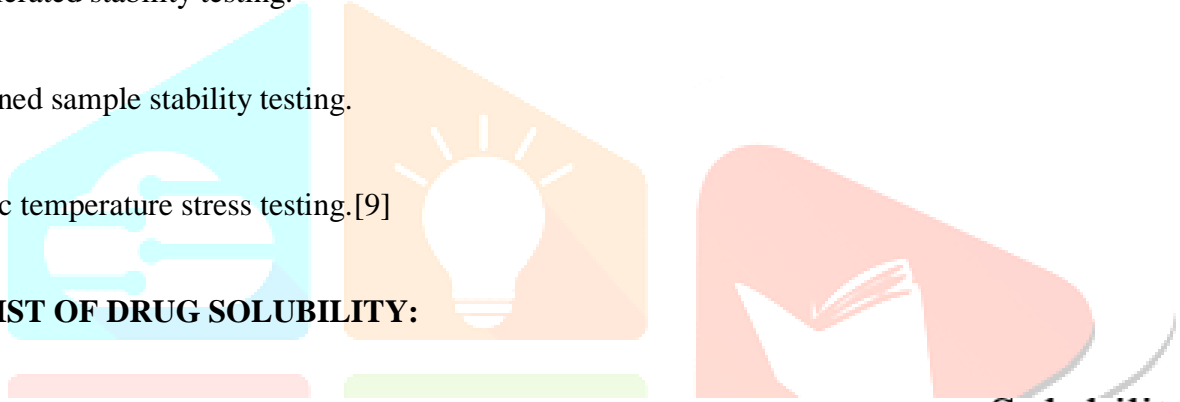
## VII. STABILITY TESTING METHOD:

Stability tests are a regular operation used in the different phases of product creating for medicinal substances and products. Recently stages use accelerated stability tests to measure the types to measure the type of degraded products found following long term storage. The main objective of the pharmaceutical stability test are to ensure that products remain on the market for the time period of their acceptable fitness or quality and fit for the consumption until the last pharmaceutical unit is used.

Stability testing procedures are divided into 4 groups

1. Real time stability testing .
2. Accelerated stability testing.
3. Retained sample stability testing.
4. Cyclic temperature stress testing.[9]

## VIII. LIST OF DRUG SOLUBILITY:



Oil(s)	Solubility (mg/ml)
Oleic acid	9.0 ± 0.045
Isoproylmyristate (IPM)	8.2 ± 0.041
Triacetin	7.5 ± 0.037
Castor oil	6.0 ± 0.031
Labrafac PG	9.4 ± 0.047
Sefsol-218	15.0 ± 0.071
Canula oil	7.0 ± 0.035
Groundnut oil	6.5 ± 0.032
Triacetin + Labrafac PG (1:1)	10.0 ± 0.051
Triacetin + oleic acid (1:1)	10.5 ± 0.054
Sefsol + oleic acid (1:1)	12.0 ± 0.059
Sefsol in ethanolic microenvironment (3:1)	86.0 ± 0.432
Sefsol in ethanolic microenvironment (2:1)	120.0 ± 0.596 <sub>[7]</sub>



## CONCLUSION:

Solubility is that the most significant physical characteristic of a drug for its oral bioavailability, formulation, development totally different of various dose varieties of different medicine, the therapeutic efficacy of the drug, and for quantitative chemical analysis. Dissolution {of medicine of medicine of medication} is that the step for oral rate determining absorption of the poorly soluble drugs and solubility is additionally the fundamental demand for the formulation and development of various dose varieties of different medicine. The assorted techniques represented on top of alone or together may be used to enhance the solubility of the drug. Solubility may be increased by several techniques and also the number of folds increase in solubility. Attributable to the solubility downside of the many medicine, the bioavailability of them gets affected, and thus solubility improvement becomes necessary.

## ACKNOWLEDGEMENT:

I would like to express my special thanks of gratitude to my mentor miss . neha kothawade as well as our principal mr. deshpane sir who guild me to complete my review article and also thanks to my co author for the best support for the review article.

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