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A REVIEW ON NANOEMULGEL

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ABSTRACT

A Nanoemul gel is a topical gel that contains a nanoemulsion dispersed within a gel matrix. The nanoemulsion is typically prepared using high shear mixing techniques and contains droplets of an oil[8] phase dispersed in an aqueous phase stabilized by surfactants or stabilizers. The resulting Nanoemul gel has several advantages over traditional emulsion-based gels, including improved stability, enhanced drug penetration, and increased bioavailability. Nanoemul gels have been studied for their potential in dermatology and drug delivery applications, showing promising results in reducing acne lesions and improving skin appearance, as well as enhancing drug delivery and reducing inflammation. Further research is needed to optimize the formulation and assess the safety and effectiveness of Nanoemul gels for different applications. Nanoemulgel consist two different systems in which drug containing nanoemulsionis incorporated into a gel base. The fusion of these two systems makes this formulation advantageous in several ways. Lipophilic drugs can be easily incorporated and the skin permeability of the incorporated drugs can be enhanced in several folds due to the finely distributed in gel phase. Simultaneously, it can be targeted more specifically to the site of action and can avoid first pass metabolism and relieve the user. The nanoemulgel formulation related intervention to improve drug absorption and therapeutic profile of lipophilic drugs. An increasing trend in nanoemulgel use in recent years has been noticed because of the better acceptability of the preparation to the patients due to their non-greasy, convenience spreadability, and easy applicability and good therapeutic and safety profile.

INTRODUCTION

A type of structural fluid known as a nanoemulsion gel combines the characteristics of nanoemulsions and gels. Nanoemulsions are clear or translucent, thermodynamically stable dispersions of oil and water, Due to their large surface area and potential to improve drug solubility , bioavailability, and targeted distribution ,they are frequently used , semisolid systems and they can offer advantageous qualities like increased adhesion, extended residence time, and improved skin penetration.Nanoemulsions gels can offer a special set of benefits in drug delivery by combining these two systems, including increased stability, controlled release, and improved skin permeability. Nanoemulsions are a type of emulsion that has droplets in nanometer range. They are considered to have better stability and bioavailability than traditional emulsions due Nanoemulgels are topical gels contain nanoemulsions. They are commonly used in dermatology for the treatment of skin conditions such as eczema, relief. They can also be used to deliver medications for pain relief, anti-inflammatory agents, and anti-infective agents. Nanogels are nanoparticles - based hydrogels that have been studied for their potential in drug delivery, tissue engineering and other biomedical applications. They are commonly used due to their biocompatibility , biodegradability and high drug loading

Nanoparticles - based hydrogels that have been studied for their potential in drug delivery, tissue engineering and other biomedical applications. They are commonly used due to their biocompatibility , biodegradability and high drug loading capacity

Ideal Properties of Nano-emulgel

1.Thermodynamically Stable
2.It should not cause irritation on skin
3.It should have antimicrobial activity
4.The viscosity should be optimal
5.The gel should be clear, homogeneous, inert in nature

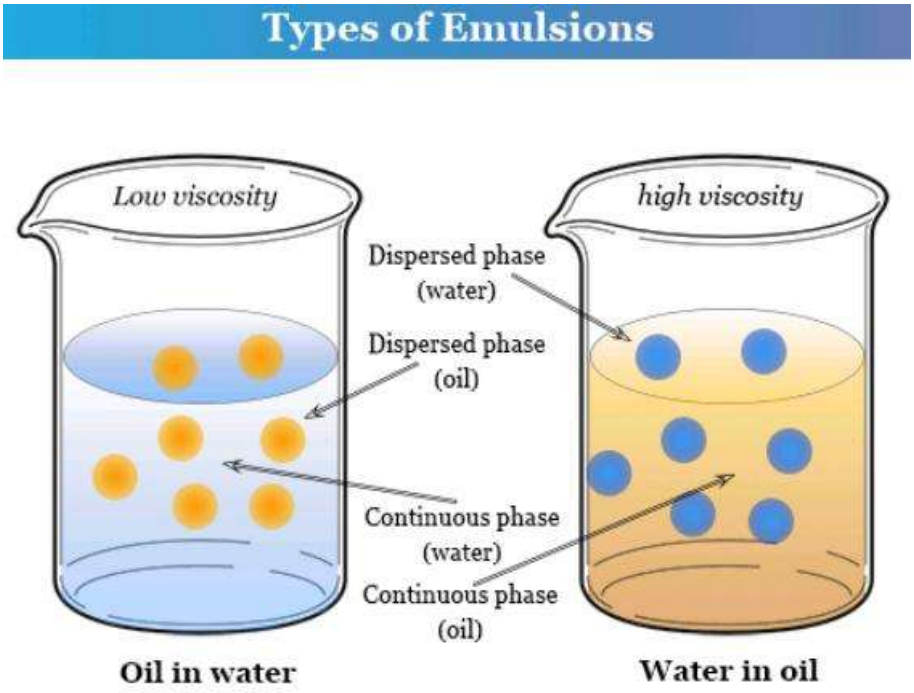
Advantages :- 1.The ability to resist First-pass metabolism
2.Effectiveness for a managed and long-term drug delivery system has been proven.
3.Skin friendly.
4.Appropriate for self-medication.
5.Patient accept it quickly.
6.Nanoemulsion provides large surface area and free energy which make an efficient delivery system.
7.Emulsion defect like Creaming, phase separation, flocculation, and coalescence is not found in nanoemulsion.8.Nanoemulsion prepared in variety of formulations, foams, creams, sprays and much other cosmetic formulation.
9.It is safe on transdermal application due to its non-toxic nature.
10.By using biocompatible surfactant in nanoemulsion formulation, it can be administered orally.

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11.It shows better penetration of drug because the nano-sized particles can easily enter by the rough skin surface.
12.By the process of precipitation and interfacial poly-condensation of nanoemulsion, nanocapsule and nanosperes are prepared

Disadvantages :-1.Bubbles formed during emulgel formulation.
2.For utilization in pharmaceutical application, surfactant used ought to be non-poisonous.
3.Possibility of allergenic reactions.
4.Skin irritation on contact dermatitis.

Emulsion:- n:- An emulsion is a mixture of two or more immiscible liquids, like oil and water, where one liquid is dispersed as tiny droplets throughout the other. To keep these liquids mixed, an emulsifier is added, which stabilizes the mixture and prevents the liquids from separating. Examples of emulsions include (Water in Oil and Oil in water)



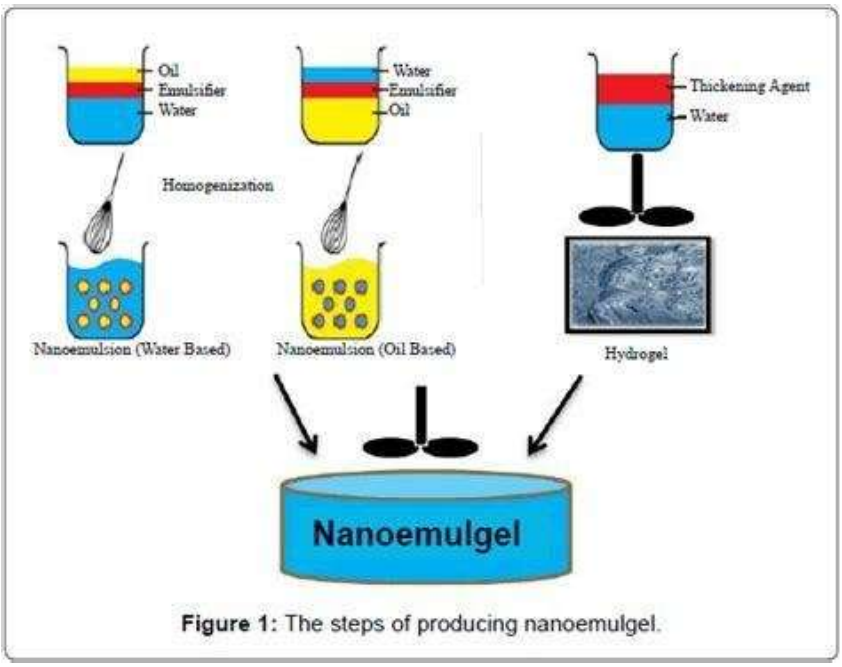


Figure 1: The steps of producing nanoemulgel.

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Nano-emulgel:- Nano-emulgels are made up of two individual systems; the gelling agent and the nano-emulsion i.e., emulsion consisting of nano droplets which are of o/w or w/o type.



Caster Oil
Synonyms-Ricinus oil
Biological source-castor oil is a vegetable oil obtained by pressing the seeds of the castor oil plant-(Ricinus communis L)
Family-Euphorbiaceae
Use-Castor oil is most commonly used as laxative



Olive oil
Synonym:- fossil oil
Biological source-olive oil is liquid fat obtained from olives(the fruit of oleo europaea.
Family-Oleaceae
Use- Use-people use olive oil in cooking, cosmetic medicine,soaps and as fuel for traditional lamps.

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Aloe vera
Synonym – Aloe
Biological Source – Aloe is the dried latex of leaves of various species of aloe
Family- Liliaceae
Use: - Natural llaxative

Turmeric:-



Synonym:- Indian Saffron,Haldi
Biological Source – Curcuma longa
Family – Zingiberaceae
Use- Antioxidant, Anti-inflammatory

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Ingredients	Quantity Taken	Importance of Ingredients
Turmeric	5gm	Antioxidant, Anti-inflammatory
Aloe vera	3-5gm	Natural laxative
Caster oil	2ml	Constipation relief, Anti-inflammatory for joint pain
Olive oil	2ml	Moisturizing agent
Water	3ml	Maintain Consistency

Procedure

-Take a turmeric 5gm in beaker
-Then add 3-5gm Aloevera extract and mixed well
-Then rest the solution for 2 min
-Then add caster oil 2ml
- then add 2ml Olive oil them mixed well
- And last step add 3ml water stur solution well
-Heating the solution upto 35°c for 5min
-After heating the solution is on room temperature
- Then apply or used.

Evaluation Test

-Stability
-Consistency
-Softening point
-Solubility test
-Surface anamolies

CONCLUSION

This review remarks that combining nanoemulgel and plant-based oils is an excellent method to optimize the formulations through different administration routes and it will create a pathway to meet market demands. The development of a stable nanoemulgel solely depends on its components including gelling agent and oil phase and the methodology that is followed. Researchers have found that nanoemulgel is an effective drug delivery system to deliver drugs to local and systemic sites of action. These plant-derived nanoemulgel formulations possessed many benefits with fewer side effects. Nanoemulgels have also shown their applications in the cosmetic and pharmaceutical industries. Therefore, there is great interest in developing novel drug delivery systems such as nanoemulgel and nanoemulsion using bioactive compounds based on nanotechnology.

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