

NANOEMULSION A METHOD TO IMPROVE THE SOLUBILITY OF

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What is nanoemulsion used for? Nanoemulsion systems have the advantage of a high capacity to solubilize drug compounds and to retain the drug in solution even after dilution. For example, nanoemulsions can improve the oral bioavailability of poorly water-soluble drugs. The self-nanoemulsified drug delivery systems can also be nanosized.

What are the methods of nanoemulsion preparation? Nanoemulsions are generally prepared by using high energy methods in which mechanical energy input is applied by high pressure homogenizers, high-shear stirring, and ultrasound generators (Sole et al., 2012). These mechanical devices provide strong forces that disrupt oil and water phases to form nanoemulsions.

How do nanoparticles increase solubility? Many newly discovered drug molecules have low aqueous solubility, which results in low bioavailability. One way to improve their dissolution is to formulate them as nanoparticles, which have high specific surface areas, consequently increasing the dissolution rate and solubility.

What are the two methods used to improve the solubility of drug? There are various techniques to enhance the drug solubility such as particle size reduction, nanosuspension, use of surfactants, salt formation, solid dispersion, etc. From this article it may be concluded that solid dispersion is an important approach for improvement of bioavailability of poor water-soluble drugs.

Are nanoemulsions safe? Most of the recent literature on the safety and toxicity of nanoemulsions in biological systems suggest that their application is safe.

What are examples of nanoemulsion drugs? Some of the nanoemulsions of the actives with poor water solubility i.e. cyclosporine (Neoral®, Gengraf®), saquinavir (Fortovase®), and ritonavir (Norvir®) have been approved by US Food and Drug Administration for clinical uses [15].

What oils are used in nanoemulsion?

What is the efficiency of nanoemulsion encapsulation? The optimal encapsulation efficiency ($62.71 \pm 2.34\%$) and particle size (652.2 ± 11.45 nm) were observed for the nanoemulsions with the polysaccharides concentration of 10.0 g/mL.

What is the difference between micro and nanoemulsion? In the w/o system the liquids proportions are reversed (Bhokare et al., 2015). The most relevant difference between microemulsion and miniemulsion polymerization processes, is based on the produced dispersed phase kinetic character in the emulsified system.

How can you increase the solubility process? Increasing the temperature, therefore, increases the solubility of the solute. An example of a solute whose solubility increases with greater temperature is ammonium nitrate, which can be used in first-aid cold packs. Ammonium nitrate dissolving in solution is an endothermic reaction.

What is the solubility of nanoparticles in water? If you have nanoparticles of table salt, then they dissolve in water, because This process is accompanied by a negative change in Gibbs energy due to an increase in entropy and hydration. To dissolve any solutes in a given solvent, solute-solvent interactions should supersede solute-solute interactions.

Does solubility increase with particle size? Therefore, fragmenting a solute into smaller bits will increase its surface area, which will, in turn, result in an increased rate of solvation or solubility.

What are 2 ways to increase solubility of a solute in a solvent? An increase in pressure and an increase in temperature in this reaction results in greater solubility. An increase in pressure results in more gas particles entering the liquid in order to decrease the partial pressure. Therefore, the solubility would increase.

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How can you improve the solubility of poor water soluble drugs? Traditional solubility enhancing methodologies, such as pharmaceutical salts, solubilization with surfactants or cosolvents, structural modifications, and solid dispersions, have been significantly contributed to improve the water solubility and bioavailability of poorly water-soluble drugs (Kawabata et al., 2011, ...

How to increase the dissolution rate of a drug? By changing the size of the particles from micron size to nano size range, the specific surface area of particles is greatly increased and causes a higher dissolution rate (46,55).

How does nano emulsion work? Nanoemulsion helps in the effective transportation of active substances through a semipermeable membrane, and due to the large surface area, penetration increases in the emulsion system. Besides preventing droplet flocculation, nanoemulsions' small globule size additionally avoids larger droplet flocculation.

How to prepare nanoemulsion? The nanoemulsion can be prepared by both high energy and low energy methods. High energy method includes high-pressure homogenization, microfluidization, and ultrasonication whereas low energy methods include the phase inversion emulsification method and the self-nanoemulsification method.

How do you stabilize nanoemulsion? Surfactants. They are amphiphilic molecules that impart stability to the nanoemulsions by preventing droplet aggregation and reducing interfacial tension. Surfactants are readily adsorbed at the oil and water interface providing electrostatic, steric, or dual electro-steric stability.

What is nanoemulsion principle? These are the thermodynamically stable isotropic system in which two immiscible liquids are mixed to form a single phase by means of an emulsifying agent, i.e., surfactant and co-surfactant. The droplet size of nanoemulsion falls typically in the range 20–200 nm.

What is a nanoemulsion in food? In the food industry, nanoemulsions are used for encapsulation of food ingredients, which includes incorporation, absorption, or dispersion of bioactive compounds within small capsules having diameters less than 100 nm.

Are nanoemulsions drug carriers? Nanoemulsions comprising EOs or antimicrobial agents or drugs can reduce viable bacteria cells more rapidly as compared to corresponding EOs or drugs alone. Due to the very small droplet size of nanoemulsion, it can easily transport the active antimicrobial components to the surface of the cell membrane.

What is nano chemical used for? Nanochemistry is a seemingly simple discipline that can be applied across numerous fields such as geology, biology, engineering, and physics. The groundwork that has been made in nanochemistry has contributed to significant advances in electronics and modern medicine.

What is nanoemulsion in wound healing? Nanoemulsions for wound healing also significantly enhanced the proliferation of fibroblast cells resulting in a reduction in the time of wound closure⁶⁵. In addition to wound healing effect, insulin loaded nanoemulsions also helped in mitigating diabetes⁹⁶.

What is nanoemulsion in cosmetic? Nanoemulsions are used in skincare products such as creams, lotions, serums, and sunscreens to improve the product's stability, texture, and efficacy. The small droplet size of the active ingredients in a nanoemulsion enhances their penetration into the skin, as they can more easily pass through its outer barrier.

What is the difference between emulsion and nanoemulsion? Nanoemulsions are emulsions with uniform and extremely small droplets with size in the range of 20–200 nm [1, 2], whereas classical emulsions are characterized by a coarse droplet size which can reach 1 μ m.

Torsional Vibration Damper: Essential for Marine Engine Stability

Question: What is a torsional vibration damper and why is it important for marine engines?

Answer: A torsional vibration damper is a mechanical device that mitigates the harmful effects of torsional vibrations in marine engines. Torsional vibrations arise from the uneven firing of cylinders, creating alternating twisting forces on the crankshaft. These vibrations can lead to fatigue failure and premature engine wear. The damper acts as a shock absorber, reducing vibrations and protecting the

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engine's components.

Question: How does a torsional vibration damper work?

Answer: Damper designs vary, but they typically consist of a heavy flywheel, rubber or viscous fluid, and a hub connected to the crankshaft. The flywheel's inertia resists torsional movement, while the rubber or fluid absorbs and dissipates the vibrations. Damper tuning is critical, as it must match the natural frequencies of the engine to effectively damp vibrations.

Question: What are the benefits of using a torsional vibration damper in marine engines?

Answer: Torsional vibration dampers provide significant benefits for marine engines:

- Extend engine life
- Reduce noise and vibration levels
- Increase engine efficiency
- Prevent crankshaft damage

Question: What factors should be considered when selecting a torsional vibration damper?

Answer: Damper selection depends on the following factors:

- Engine speed and power
- Number of cylinders
- Firing order
- Crankshaft design

Proper damper tuning is crucial to maximize effectiveness and prevent resonance.

Question: How can torsional vibration dampers be maintained and serviced?

Answer: Regular inspections and maintenance are essential for optimal damper performance. Inspections should include checking for wear, damage, or loose connections. The damper's viscoelastic material may need to be replaced over time

to maintain its effectiveness. Additionally, periodic recalibration may be necessary after engine overhauls or modifications.

The Art of Magic: The Gathering's Zendikar

What is Zendikar?

Zendikar is a plane in the popular trading card game Magic: The Gathering. It is a world of towering mountains, ancient ruins, and dangerous creatures. Zendikar is also rich with mana, the lifeblood of magic.

What are the unique features of Zendikar?

Zendikar has several unique features that set it apart from other planes in Magic: The Gathering. These features include:

- **Landfall:** Zendikar is a plane where land plays a major role. Many cards in the Zendikar set have abilities that trigger whenever a land enters the battlefield.
- **Expedition:** Zendikar is a world of adventure and discovery. Many cards in the Zendikar set have abilities that reward players for exploring.
- **Eldrazi:** Zendikar is home to the Eldrazi, a race of ancient and powerful beings. The Eldrazi are a constant threat to the inhabitants of Zendikar.

What are some examples of iconic Magic: The Gathering cards from Zendikar?

Some of the most iconic Magic: The Gathering cards from Zendikar include:

- **Valakut, the Molten Pinnacle:** A powerful land that deals damage to opponents for each Mountain you control.
- **Expedition Leader:** A creature that gives a bonus to other creatures whenever a land enters the battlefield.
- **Ulamog, the Infinite Gyre:** A massive Eldrazi creature that can destroy entire armies.

What is the future of Zendikar in Magic: The Gathering?

Zendikar is a popular and iconic plane in Magic: The Gathering. It is likely that we will see more sets and cards from Zendikar in the future.

How is Colleen Stan now? Colleen Stan, now 67, has changed her name and reportedly still lives in California. She has spoken publicly about her ordeal, including on Oprah Winfrey's show in 1987 and for the 2016 documentary "Colleen Stan: The Girl in the Box."

Is the perfect victim the true story of the girl in the box by the DA that prosecuted her captor? "Perfect Victim" tells the bizarre story of a young woman kidnapped while hitchhiking from Oregon to her home in California in 1977. Colleen Stan is sadistically kept prisoner for most of 7 years. She is forced to spend many nights in a small box; a "dungeon" would be too generous a description.

Why didn't Colleen Stan escape? Stan's fear of The Company stopped her from escaping or revealing any information to her family. Colleen Stan was kept captive for seven years from 1977 to 1984. Towards the end of that seven-year span, Cameron stated that he wanted Stan as a second wife.

Who was the girl trapped in the box for 7 years? Girl in the Box is the terrifying true story of Colleen Stan's 1977 abduction. At 22, Colleen accepted a ride from a nice young couple — and then spent the next seven years enslaved, held captive in a coffin-sized box.

How did Colleen Stan get free? Finally, in August 1984, Janice chose to end the hell Stan was enduring after Cameron decided he wanted a second sex slave, which went against an agreement the couple had made together. Janice told Stan the truth, admitting The Company was all a lie, and she helped her hostage escape.

What happened to the couple who kidnapped Colleen Stan? Janice was granted immunity from prosecution in exchange for testimony, while Cameron was found guilty on multiple charges and sentenced to 104 years in prison. Stan's case has received international publicity, and been the subject of multiple books, films, and television series.

How accurate is the girl in the box movie? Unfortunately is based on a true story. A shocking movie that shows the true store of a girl who was hitchhiking and was

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kidnapped by an unsuspected couple by several years. The girl was living in a box most of the time, humiliated all time and treated as a slave.

How was the girl in the box tortured? Stan was subjugated to years of torture, often spending 23 hours of the day in a tiny wooden coffin-like structure, often with the head box still on. She was given little food to eat, was repeatedly raped, whipped, electrocuted, and burned, and was left chained and dangling from a rack.

How long did they keep the girl in the box? [Watch Colleen Stan: The Girl in the Box on A&E Crime Central.] For seven years, Stan was held captive. She was locked in a small coffin-like wooden box the Hookers kept under their bed; occasionally, she would be let out—but only to be raped, whipped or forced to do household chores.

Did Colleen Stan have Stockholm Syndrome? This case is often seen as meeting many criteria of Stockholm syndrome. Her situation lasted for longer than several days and she had constant contact with her captors.

Who was the girl held captive for years? Jaycee Lee Dugard was just 11 years old when she was abducted on her way to school in 1991 — not to be seen again for 18 years, when she was finally rescued in 2009. The story of how Jaycee was snatched in broad daylight, just steps from her South Lake Tahoe, Calif. home, captivated the nation in 1991.

What movie is the girl imprisoned for 7 years? Room is a 2015 internationally co-produced survival psychological drama film directed by Lenny Abrahamson and written by Emma Donoghue, based on her 2010 novel. It stars Brie Larson as a young woman who has been held captive for seven years and whose five-year-old son (Jacob Tremblay) was born in captivity.

Who was the girl found dead in a suitcase? Sandra Renee Cantu (March 8, 2001 – March 27, 2009) was an American girl who gained national attention after she disappeared from Tracy, California, on March 27, 2009. Her body was discovered ten days later inside a suitcase in a local irrigation pond.

Who was the woman trapped for 24 years? The Fritzl case emerged in 2008, when a woman named Elisabeth Fritzl (born 6 April 1966) informed investigators in

the city of Amstetten, Lower Austria, that she had been held captive against her will for 24 years by her father, Josef Fritzl (born 9 April 1935).

Who was the woman trapped in a room for 24 years?

Is Colleen Stan married? Today, Stan is married for the fourth time and raising her grandson, who turns 2 at the end of September. Despite all that she's been through, Stan says she has had a wonderful life since her escape and is grateful to be alive.

Did Colleen Stan have Stockholm Syndrome? This case is often seen as meeting many criteria of Stockholm syndrome. Her situation lasted for longer than several days and she had constant contact with her captors.

When was Colleen Stan released? Initially, Cameron only released Stan from her confinement to beat her and force her to engage in intimate relations. After extended psychological coercion, Stan became a live-in babysitter and sex slave for the couple. Stan was able to survive her horrific ordeal and escape in 1984 with the help of his wife.

Did they find Marliz Spannhake? Spannhake, who disappeared in 1976, the year before Stan's abduction, remains missing to this day.

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