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Nanoemulsion Market Forecasts to 2030 – Global Analysis By Type (Oil-in-Water Nanoemulsion, Water-in-Oil Nanoemulsion and Bi-Continuous Nanoemulsion), Composition, Preparation Method, Stability, Route of Administration, Application and By Geography

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Abstracts

According to Stratistics MRC, the Global Nanoemulsion Market is accounted for $12.84 billion in 2024 and is expected to reach $20.17 billion by 2030 growing at a CAGR of 9.2% during the forecast period. A nanoemulsion is a type of emulsified system consisting of finely dispersed droplets of one liquid in another, typically with droplet sizes ranging from 20 to 200 nanometers. These systems are transparent or translucent and are thermodynamically stable. They can carry both hydrophilic and lipophilic compounds, offering a versatile solution for formulating products with improved performance and stability compared to traditional emulsions.

According to a research article by News-Medical.Net, in September 2020, researchers stated that nanoemulsion systems can produce immune responses that are similar to live attenuated vaccines but do not run the risk of reversion.

Market Dynamics:

Driver:

Increasing demand for skincare and anti-aging products

Nanoemulsions provide enhanced penetration and absorption of active ingredients like

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vitamins, antioxidants, and peptides, which are key components in skincare formulations. Their ability to deliver these ingredients deeper into the skin improves product efficacy and provides better results for anti-aging benefits. Additionally, nanoemulsions offer improved stability, extended shelf life, and the ability to create lightweight, non-greasy formulations, all of which appeal to consumers seeking more effective, innovative skincare solutions. This demand boosts the adoption of nanoemulsion technology in the cosmetics industry.

Restraint:

Stability issues

Stability issues in nanoemulsions arise due to factors like particle aggregation, phase separation, and coalescence, which can occur over time or under specific storage conditions. These issues are often caused by improper formulation, high energy requirements, or external factors like temperature fluctuations and pH changes. Such instability hampers the market growth by limiting the shelf life and effectiveness of nanoemulsion-based products, particularly in pharmaceuticals and cosmetics.

Opportunity:

Growing demand in pharmaceuticals

Nanoemulsions enhance the bioavailability, stability, and solubility of poorly water-soluble drugs, making them ideal for delivering active pharmaceutical ingredients effectively. With increasing research into novel formulations, particularly in targeted therapies, vaccines, and biologics, nanoemulsions offer a promising solution for improved drug absorption and controlled release. The rise in chronic diseases, personalized medicine, and the need for safer, more efficient drug delivery systems further boosts the adoption of nanoemulsion technology in the pharmaceutical sector, fueling market growth.

Threat:

High production costs

Nanoemulsion requires high production costs due to the need for specialized equipment, advanced raw materials, and complex manufacturing processes to achieve precise control over droplet size and stability. Techniques such as high-pressure

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homogenization and microfluidization contribute to increased costs. Additionally, ensuring consistency, scalability, and regulatory compliance adds financial burdens. These elevated costs can hamper market growth by limiting accessibility, especially for small and medium-sized enterprises.

Covid-19 Impact

The covid-19 pandemic had a mixed impact on the nanoemulsion market. On the positive side, there was increased demand for nanoemulsions in pharmaceuticals for vaccine delivery systems, antivirals, and personal protective products. The surge in demand for sanitizers, disinfectants, and skin-care products also boosted the market. However, disruptions in supply chains, manufacturing delays, and a slowdown in R&D activities during lockdowns hindered growth. Despite these challenges, the market showed resilience due to the growing need for advanced drug delivery systems.

The oil-in-water nanoemulsion segment is expected to be the largest during the forecast period

The oil-in-water nanoemulsion segment is predicted to secure the largest market share throughout the forecast period. Oil-in-water nanoemulsions are emulsions where tiny droplets of oil are dispersed in a water phase, typically with droplet sizes ranging from 20 to 200 nanometers. This type of nanoemulsion is widely used in pharmaceuticals, cosmetics, and food products. Oil-in-water nanoemulsions offer improved stability, reduced toxicity, and controlled release of active ingredients, making them ideal for drug delivery systems, skincare products, and functional food formulations.

The food & beverages segment is expected to have the highest CAGR during the forecast period

The food & beverages segment is anticipated to witness the highest CAGR during the forecast period. In the Food & Beverages industry, nanoemulsions are used to improve the delivery of flavours, nutrients, and bioactive compounds. They enhance the stability, solubility, and absorption of ingredients like vitamins, antioxidants, and essential oils, making them more effective in products like fortified drinks, functional foods, and flavouring agents. Their ability to deliver consistent quality and maintain emulsions without separation drives innovation in the sector.

Region with largest share:

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Asia Pacific is expected to register the largest market share during the forecast period due to the increasing demand for advanced drug delivery systems, personal care products, and food & beverage applications. Countries like China, India, and Japan are major contributors, driven by expanding pharmaceutical, cosmetic, and nutraceutical industries. The region's rising healthcare awareness, along with growing investments in biotechnology and nanotechnology, supports market expansion. Additionally, the demand for eco-friendly, sustainable products in cosmetics and food sectors is fueling the adoption of nanoemulsions in the region.

Region with highest CAGR:

North America is expected to witness the highest CAGR over the forecast period driven by advancements in drug delivery systems, pharmaceuticals, and the cosmetic industry. The U.S. is a key market player, with rising demand for innovative drug formulations, including vaccines and biologics. The region benefits from robust R&D activities, technological advancements, and a well-established healthcare infrastructure. Additionally, increasing consumer demand for eco-friendly and sustainable formulations in both cosmetics and food sectors is further boosting the adoption of nanoemulsion technologies in North America.

Key players in the market

Some of the key players profiled in the Nanoemulsion Market include AbbVie Inc., AstraZeneca, Allergan, Sanofi, Novartis AG, Pfizer Inc., GlaxoSmithKline plc, Johnson & Johnson, Amgen Inc., Merck & Co., Inc., Bayer AG, Eli Lilly and Company, Hoffmann-La Roche Limited, Takeda Pharmaceutical Company Limited, OrganiGram Holdings Inc., Teva Pharmaceutical Industries Limited, Bausch Health Companies Inc., Lupin Pharmaceuticals, Inc., Cipla Limited, Sun Pharmaceutical Industries Limited and Boehringer Ingelheim.

Key Developments:

In November 2024, Organigram has introduced FAST™ Nanoemulsion Gummies, an innovative addition to their product line-up. These gummies leverage advanced nanoemulsion technology to offer rapid onset of effects compared to traditional cannabis edibles. Each gummy contains an accurately measured dose of cannabinoids, catering to both new and experienced users looking for predictable results.

In July 2024, Lupin Limited has partnered with Huons Co. Ltd., a South Korea-based

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pharmaceutical firm, to introduce Cyclosporine Ophthalmic Nanoemulsion in the Mexican market. This innovative product is designed to treat chronic dry eye syndrome, providing enhanced bioavailability and prolonged therapeutic effects due to its nanoemulsion-based formulation.

Types Covered:

- Oil-in-Water Nanoemulsion
- Water-in-Oil Nanoemulsion
- Bi-Continuous Nanoemulsion

Compositions Covered:

- Surfactants
- Co-surfactants
- Aqueous Phase
- Other Compositions

Preparation Methods Covered:

- High-Pressure Homogenization
- Ultrasonication
- Microfluidization
- Spontaneous Emulsification
- Solvent Evaporation
- Other Preparation Methods

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Stabilities Covered:

- Thermodynamically Stable
- Kinetically Stable

Route of Administrations Covered:

- Oral
- Intravenous
- Topical
- Pulmonary

Applications Covered:

- Pharmaceuticals
- Food & Beverages
- Cosmetics & Personal Care
- Agriculture
- Paints & Coatings
- Other Applications

Regions Covered:

- North America
  - US

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- Canada
- Mexico

Europe

- Germany
- UK
- Italy
- France
- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil

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Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

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SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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