NanoThermX™

Advanced Stable Nanofluid Synthesis Process

"Enhancing Thermal Performance Through Nanotechnology Innovation."

Technology

NanoThermX™ introduces a novel method for producing high-performance nanofluids through an irradiation-assisted synthesis process that combines a base fluid with a selected precursor. This innovative approach improves the stability, dispersion, and uniformity of nanoparticles within the fluid, effectively addressing a long-standing challenge in nanofluid technology—agglomeration and sedimentation.

The resulting nanofluids demonstrate superior thermal conductivity, viscosity, dielectric strength, and heat transfer coefficients compared to conventional formulations. By preventing nanoparticle clustering and enhancing interfacial bonding, NanoThermX™ ensures consistent, reliable performance over extended operational lifespans.

This technology offers significant advantages for cooling, lubrication, and energy systems, supporting advancements in renewable energy, automotive, and electronic applications that demand efficient heat management and stability.

Market need

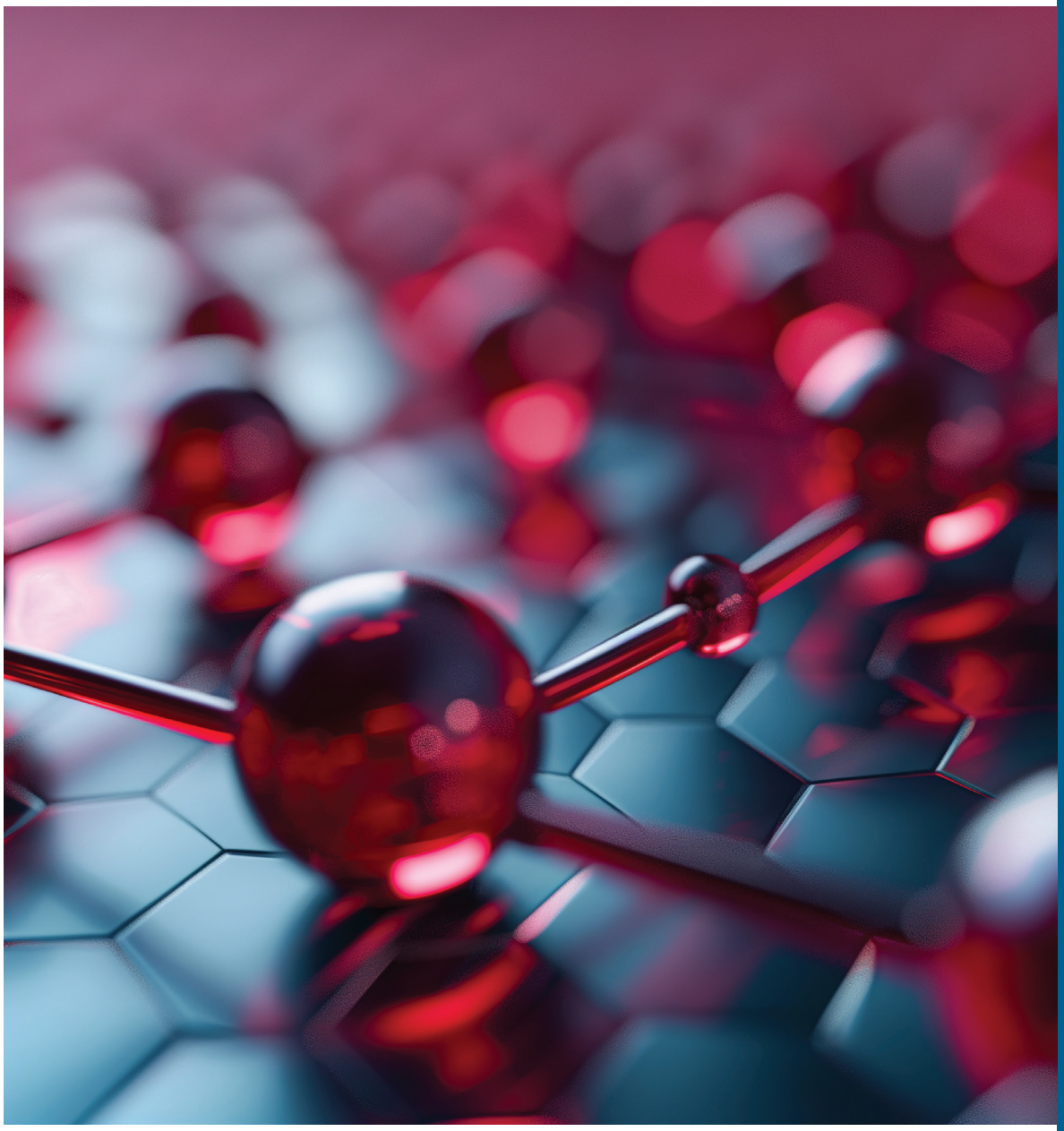
Nanofluids have high potential to become an alternative working fluid for thermal power generation in fossil fuels, nuclear power, biomass, or concentrating solar power, due to higher thermal performances compared to water combustion gases. Due to their improved thermophysical properties, nanofluids have excessive potential for improving heat transfer efficiency. Among the applications of this technology, its use to enhance the heat transfer of solar collectors seems promising. It is therefore not a surprise that the use of nanofluids in solar collectors has become a popular research area. This technology could enable smaller, cost-effective, and much more efficient concentrated solar plants in the future.

Features

- Continuous and scalable production of nanofluids suitable for industrial applications.
- High stability and uniform dispersion of nanoparticles within carrier liquids such as water, engine oil, transmission oil, or ethylene glycol.
- Enhanced thermal conductivity of up to 200% improvement over conventional heat transfer fluids.
- Clean and eco-friendly manufacturing method, eliminating chemical waste and reducing processing costs.
- Versatile material compatibility, allowing the use of metals, oxides, carbides, and nitrides as nanoparticle sources.
- Improved energy efficiency and heat transfer performance for advanced cooling and thermal management systems.

Benefits

- Irradiation-based synthesis yields uniformly dispersed nanoparticles
- Enhanced thermal and dielectric properties over conventional nanofluids
- Improved long-term stability against agglomeration and sedimentation
- Scalable and adaptable to multiple base fluids and nanoparticle types
- Energy-efficient production process with minimal chemical additives



Industry

Energy

Possible Applications

- Heat transfer and cooling systems for industrial and electronic devices
- Renewable energy systems (solar thermal, geothermal)
- High-performance lubricants and transformer oils
- Power generation and energy storage applications

Creators

Maalik Maaza

Khamlich Touria

Stage of Development

Lab-scale prototype developed

Intellectual Property

Patent Protection

Desired Relationship

Co-development investor