CloudHarvest™

Cloud Seeding/Magnesium Carbonate Ice Nucleating Agent

"Seeding the Future with Rain."

Technology

CloudHarvest ™ is an innovative solution that tackles the rising frequency of droughts and water shortages caused by climate change. It offers a sustainable way to influence weather patterns and water availability in vulnerable regions. During severe droughts, cloud seeding has been proven as an effective method to fight water scarcity by artificially inducing rainfall, especially in arid areas or coastal regions with limited natural precipitation.

The process begins with a solution containing magnesium ions that absorb CO2, followed by the introduction of magnesium carbonate (MgCO3) particles into the atmosphere, which may serve as ice nucleating agents to enhance precipitation and rainfall.

Market need

The rising frequency and severity of droughts caused by climate change have increased global demand for sustainable water generation technologies. Traditional cloud-seeding materials like silver iodide pose environmental concerns due to their toxicity, which impacts soil and water systems. Consequently, traditional cloud seeding fails to meet sustainability standards. The CloudHarvest ™ technology using MgCO3 is environmentally friendly and non-toxic to animals, making it a better alternative to conventional cloud seeding materials.

Features

- Uses bi-engineered or naturally sourced $MgCO_3$ nanoparticles as the nucleating agent.
- Likely effective across various atmospheric conditions, not limited to specific cloud types.
- Potential uses in artificial rain, snow creation, and ice recovery systems.

Benefits

- The CloudHarvest™ offers an environmentally friendly, non-toxic materials solution, coupled with the potential to enhance precipitation.
- Demonstrates strong ice nucleation performance with reproducibility.
- Can be mass-produced using bioengineering or mineral-based synthesis methods
- Offers a lower-cost alternative to AgI and dry ice.
- Supports global climate adaptation strategies particularly in drought-affected, coastal, or agriculturally stressed regions.

Industry
Water

Potential applications
- Drought mitigation: inducing rainfall in arid and drought-prone regions to replenish water resources.
- Agricultural support: enhancing precipitation to sustain crops and reduce irrigation dependency.
- Water resource management: improving reservoir levels and groundwater recharge in water-scarce areas.
- Climate adaptation programs: supporting regional and national initiatives aimed at combating the effects of climate change.
- Snow and ice generation: creating artificial snow for water storage, ski resorts, or glacial restoration projects.
- Environmental protection: replacing toxic cloud-seeding agents with an eco-friendly, non-toxic alternative.

Creators
Prof Malek Maaza
Prof Khosroshahi Shafiei Shiva
Dr Meisam Aligholami
Dr Razieh Morad
Dr Mahmood Akbari

Stage of development
Early stage

Intellectual property
Patent Protection

Desired relationship
Co-development, Investors