

Artificial Nitrogenase (Artn2ase) Enzymes For Biocatalytic Reduction Of N2 Into Ammonia

Tech ID: 34175 / UC Case 2024-9C0-0

BRIEF DESCRIPTION

A revolutionary enzyme technology for ambient temperature and pressure ammonia synthesis from dinitrogen gas.

FULL DESCRIPTION

Artificial Nitrogenase (ArtN₂ase) enzymes are a groundbreaking class of computationally engineered proteins that catalyze the conversion of dinitrogen (N₂) to ammonia (NH₃) under ambient conditions. These enzymes incorporate natural or synthetic cofactors to mimic the nitrogenase enzyme's functionality. This innovation offers a sustainable and decentralized alternative to the traditional Haber-Bosch process for ammonia synthesis, operating without the need for harsh reaction conditions or fossil fuel-derived inputs.

SUGGESTED USES

- » Decentralized and sustainable ammonia production for fertilizers and chemicals.
- » Fertilizer manufacturing tailored for off-grid or resource-constrained regions.
- » Green hydrogenation processes and nitrogen-transfer catalysis.
- » Biomanufacturing platforms for carbon-neutral chemical synthesis.
- » Research in synthetic biology and advanced protein engineering.

ADVANTAGES

- » Catalyzes ammonia synthesis at room temperature and atmospheric pressure.
- » Eliminates the need for hydrogen gas, high temperatures, or high pressures.
- » Reduces carbon emissions associated with traditional nitrogen fixation processes.
- » Modular design facilitates adaptation to various nitrogen-transfer and hydrogenation reactions.
- » Integrates computational design and synthetic chemistry for unprecedented control over enzyme functionality

PATENT STATUS

Patent Pending

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OTHER INFORMATION

CATEGORIZED AS

- » **Agriculture & Animal Science**
 - » Other
- » **Biotechnology**
 - » Other
- » **Materials & Chemicals**
 - » Other

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