# Fixation of nitrogen from renewable resources using non-thermal plasma

A system that fixates nitrogen from air and water to produce nitrate-rich liquids using non-thermal plasma-assisted catalytic reactions.

IP Status: US Patent Pending; Application number PCT/US2024/010186

### **Applications**

• Liquid nitrogen fertilizer

### **Technology Overview**

The Haber-Bosch industrial process, which produces the majority of nitrogen fertilizers, requires high energy consumption and significantly contributes to carbon emissions. As a result, environmentally friendly and sustainable alternatives to the Haber-Bosch process are in high demand. Researchers at the University of Minnesota have developed a system that fixates nitrogen from air and water to produce nitrate-rich liquids using non-thermal plasma-assisted catalytic reactions. The resultant nitrate-rich liquid has potential to be used as a nitrogen fertilizer for agricultural applications. This innovative system uses renewable resources in an ondemand manner, thereby significantly reducing carbon emissions from production and transportation.

# **Phase of Development**

# TRL: 3-4

This system has been demonstrated to produce a lab scale of nitrate-rich liquids.

# **Desired Partnerships**

This technology is now available for:

- License
- · Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

### Researchers

- Roger Ruan, PhD Professor, Department of Bioproducts and Biosystems Engineering
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## **Technology ID**

2023-089

# Category

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