

Non-thermal plasma process for Liquid fertilizer production

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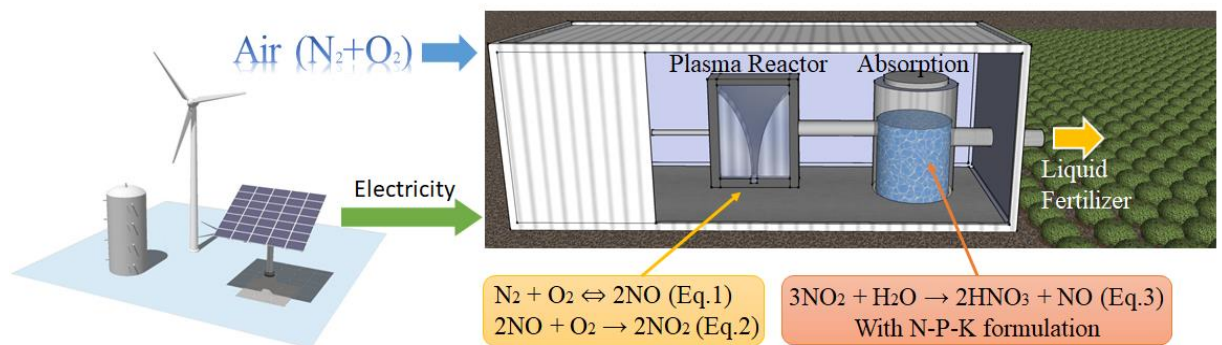
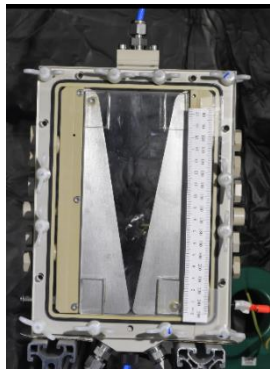


Introduction

Fertilizer is an important factor in food production. Traditionally, the nitrogen containing fertilizer is produced through nitrogen fixation route as the Haber-Bosch, which consumes large amount of energy and raises environmental concerns. Non-thermal plasma process has many advantages such as one-step synthesis, instant control, suitable for small-scale and decentralised production. In addition, the plasma process could be powered by renewable energy and working without greenhouse gas emission or waste production, making the process environment-friendly.

Project summary

This research will mainly focused on plasma assisted nitrogen fixation process. Based on existing gliding arc plasma discharge reactor, investigation on NO_x production from atmospheric air will be conducted.



The aim of this research is to increase the energy efficiency for nitrogen fixation and increase the productivity of the plasma assisted fertilizer production process. The liquid fertilizer produced will be applied to meet the demand of real case cultivation, including soil growing and hydroponics.

Project goals

It is expected to achieve an obvious increase in energy efficiency and productivity of current plasma plant through intensive experimental study.

The capacity of the plant should reach 2 mol of NO³⁻/day, enough to produce 1.24 kg of liquid solution with 10% KNO₃ concentration for distribution and dilution

At the same time the mechanism of plasma assisted nitrogen fixation will be explored.

Contact information

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