

# Dinitrogen pentoxide generator

- **N<sub>2</sub>O<sub>5</sub> generators** capable of **sterilizing, killing viruses** and **enhancing plant immunity**
- **N<sub>2</sub>O<sub>5</sub>** can be generated **safely** and **reasonable**.

## Overview

- Conventional N<sub>2</sub>O<sub>5</sub> generator is **difficult to handle** because of **the need for hazardous raw materials and complicated equipment**, which makes industrial N<sub>2</sub>O<sub>5</sub> utilization difficult.
- Since **the invention succeeded in using Air as the raw material gas**, it became possible to **generate N<sub>2</sub>O<sub>5</sub> reasonable and safety**.
- It is expected to solve the problems of conventional light and heat sterilization methods and virus inactivation methods, so on.

<Application example>

### Enhancement of plant immunity

⇒ Expression of disease resistance genes in plants

### Application of fertilizer components

⇒ Promotion of plant growth by supplying nitrogen components

### Sterilization and virus removal

⇒ Sterilization and virus removal by N<sub>2</sub>O<sub>5</sub>

## Product Application of the invention

- N<sub>2</sub>O<sub>5</sub> generator

## IP Date

IP No : PCT/JP2021/027883 PCT/JP2021/037518  
 Inventors : KANEKO Toshiro, TAKASHIMA Keisuke, SASAKI Shota, TAKAHASHI Hideki, ANDO Sugihiko, HIGASHITANI Atsushi, DAIGAKU Yasukazu  
 Admin No : T20-332, T21-149

## Performance, features, etc.

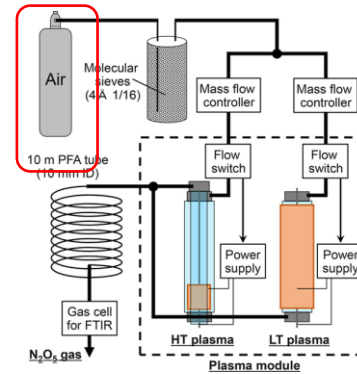


Fig 1. N<sub>2</sub>O<sub>5</sub> generator

< Conventional methods >  
 Sulfuric acid and nitric acid are needed  
 ⇒ Hazardous and difficult to handle

< Invention >  
**N<sub>2</sub>O<sub>5</sub> is generated by Air**  
 ⇒ Reasonable and Safe

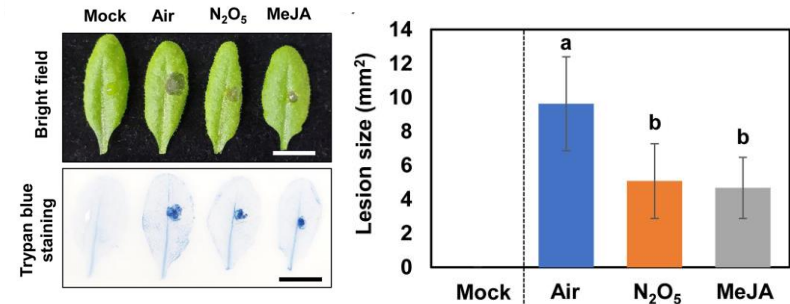


Fig 2. The result of plant immunity test

- Leaves inoculated with Botrytis bacteria were exposed to Air, N<sub>2</sub>O<sub>5</sub>, and MeJA\*.
  - The lesion area of N<sub>2</sub>O<sub>5</sub> was similar to MeJA
- ⇒ **Exposure to N<sub>2</sub>O<sub>5</sub> makes plants less susceptible to disease**

\*MeJA...methyl jasmonate

## Related literature

[1] S.Sasaki, K.Takashima, T.Kaneko *Ind. Eng. Chem. Res.* 2021, **60**, 1, 798–801  
 [2] D. Tsukidate, K. Takashima, S. Sasaki, S. Miyashita, T Kaneko, H.Takahashi, S. Ando, *PLOS ONE* 17 (2022) e0269863

## Contact