

Innovative Circular Technologies for Harmful Nitrogen Compounds/ To Solve Planetary Boundary Issues

Theme 2. Recycling nitrogen compounds in wastewater to ammonia resource
Theme 2-2. R&D on ammonia recycling by separation and concentration
Evaluation and Development of implementation of NH_4^+ recycling process
utilizing NH_4^+ adsorbent in wastewater

Presenter : Kanami Kogure (FUSO Corporation)

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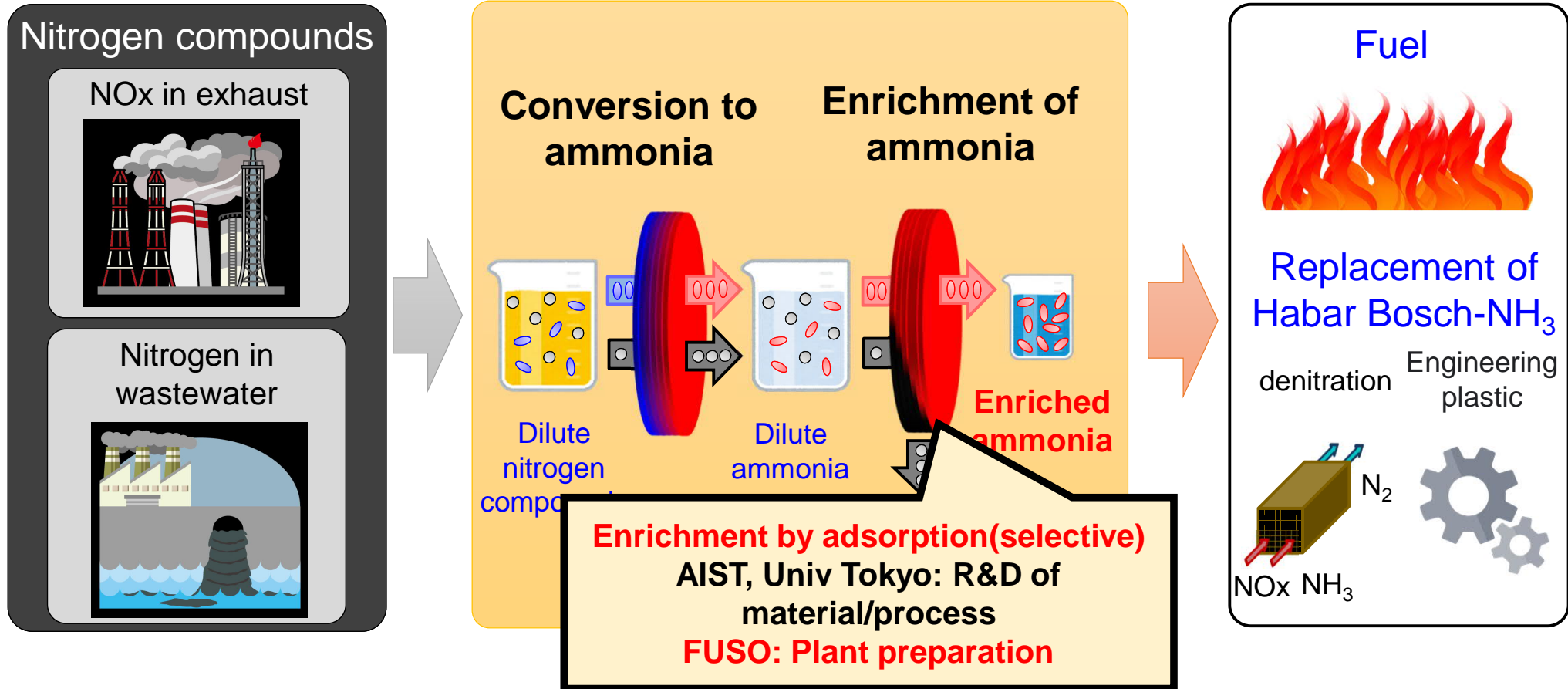
Implementing organizations : National Institute of Advanced Industrial Science and Technology (AIST),

The University of Tokyo, Waseda University,

Tokyo University of Agriculture and Technology, Kobe University,

Osaka University, Yamaguchi University, Kyowa, Hakko Bio Co., Ltd.,

ASTOM Corporation, Toyobo Co., Ltd., FUSO Corporation, Ube Industries, Ltd,



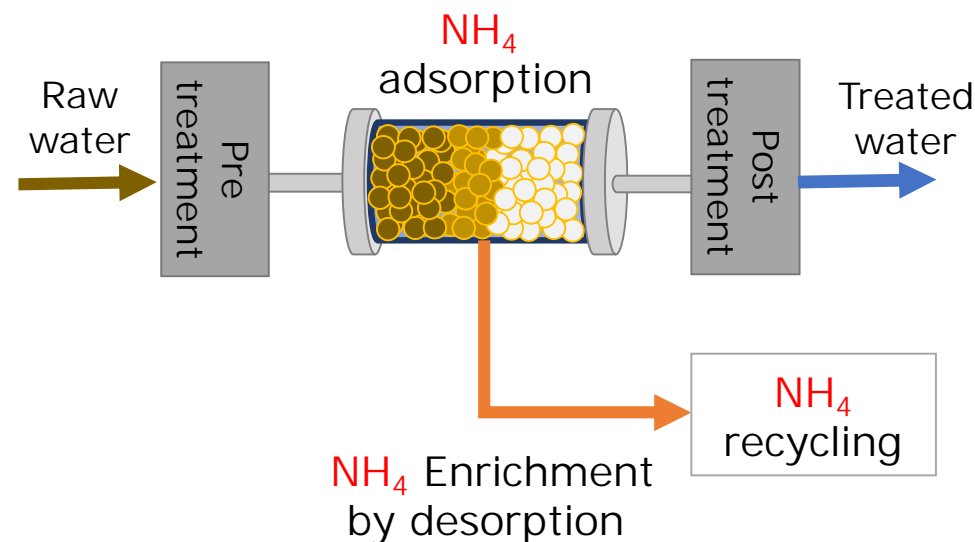
Target of Theme 2 for FY2029 : demonstration with a pilot plant with and enrichment on a scale of 5~15 m³/d.

Position of FUSO : design of column system with Adsorbents and Adsorption Technology for Selective NH₄⁺ Enrichment, and design of bench plant

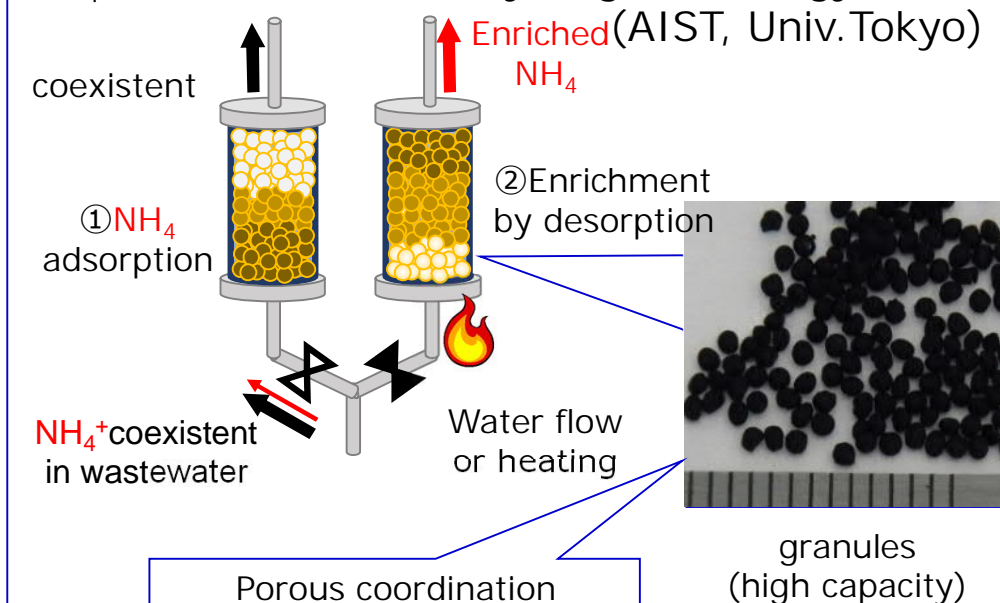
Target of FUSO for FY2029: operating demonstration of pilot plant for NH₄⁺ recycling

Design of process to implement ammonium adsorbent and recycling technology developed by AIST and University Tokyo

Column system



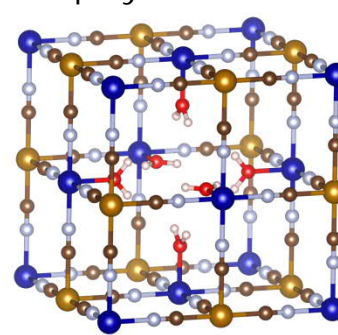
NH₄⁺ adsorbent and recycling technology



R&D Items

- Design of column system for NH₄⁺ ions in water
- Design of bench plant
- Evaluation of economic efficiency of NH₄⁺ adsorbent and recycling process

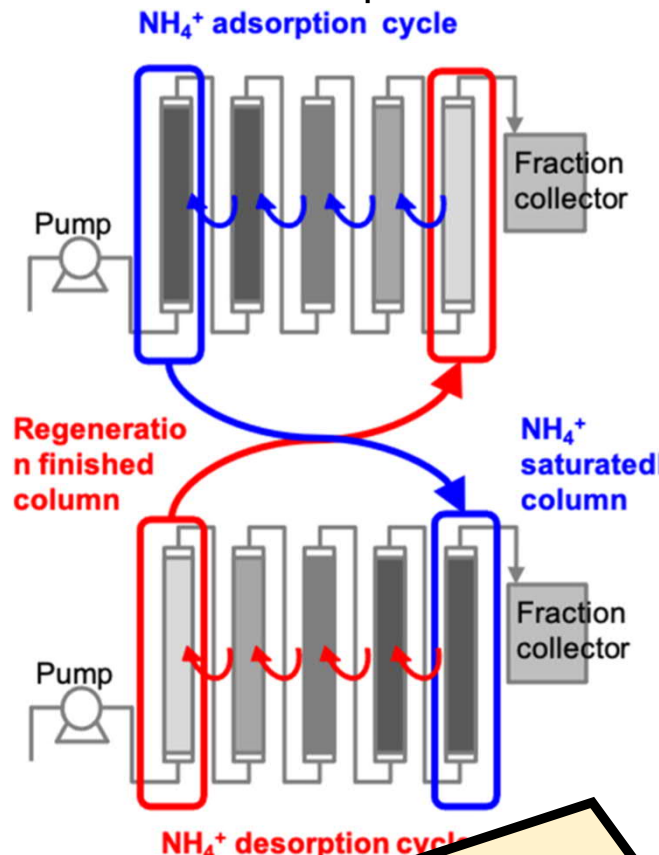
Porous coordination polymer etc.



Synthesize the optimal adsorbent for each condition of use.

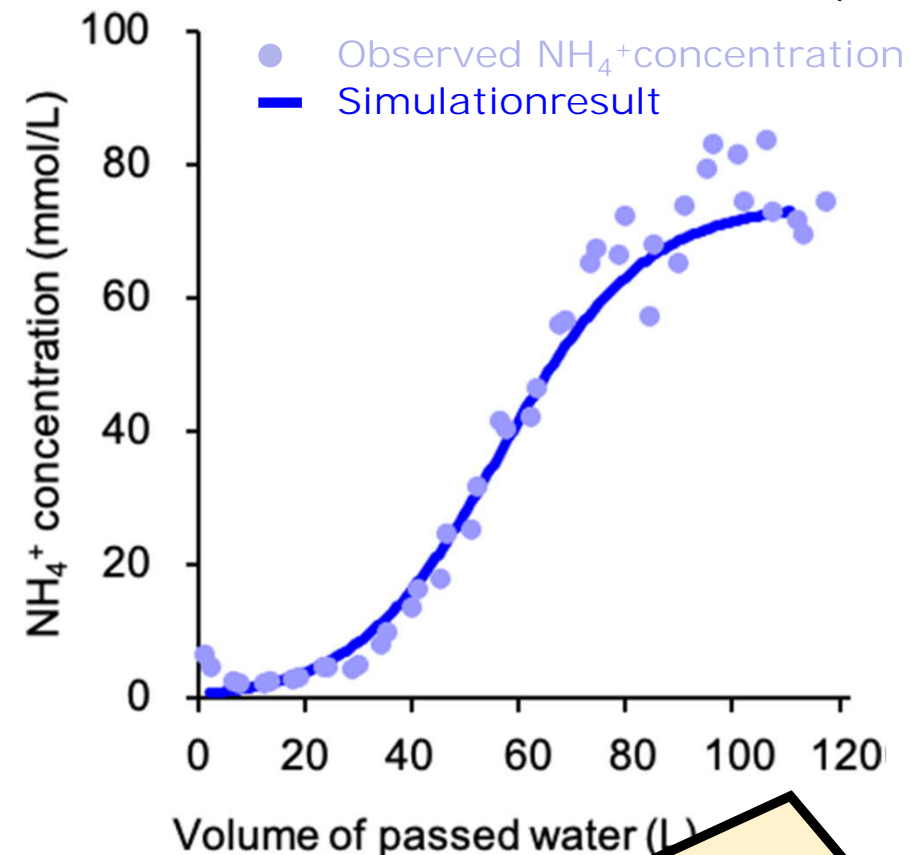
- Design of column system for NH_4^+ ions in water and extraction of issues to be verified in bench plant
- NH_4^+ adsorption with column system

Schematics of multi-staged column system for continuous NH_4^+ adsorption and desorption



Design review of column system

NH_4^+ adsorption test and simulation result (NH_4^+ concentration at column outlet)



NH_4^+ Adsorption with column system

Position in the project

Design of column system with Adsorbents and Adsorption Technology for Selective NH_4^+ Enrichment, and design of bench plant

Target for FY2029

Operating demonstration of pilot plant for NH_4^+ recycling.

R&D items

- Design of column system for NH_4^+ ions in water
- Design of bench plant
- Evaluation of economic efficiency of NH_4^+ adsorbent and recycling process

Achievement

- Design of column system and extraction of issues to be verified in bench plant
- NH_4^+ adsorption with column system

