

Research area of SWAT lab

1 Water Reuse

Target water or compounds

- Wastewater reuse
- Ultra pure water reuse

Process

- Forward osmosis (FO)
- Reverse osmosis (RO)
- Nano and Ultra filtration (NF and UF)
- Moving Bed Biofilm Reactor (MBBR)
- Dynamic membrane (DM)



2 Resource Recovery

Target water or compounds

- Nitrogen source recovery (ammonia etc.)
- Carbon source recovery (fatty acids etc.)
- Valuable source recovery from wastewater

Process

- Membrane contactor (MC)
- Forward osmosis (FO)
- Electro-chemical process

3 Water Purification

Target water or compounds

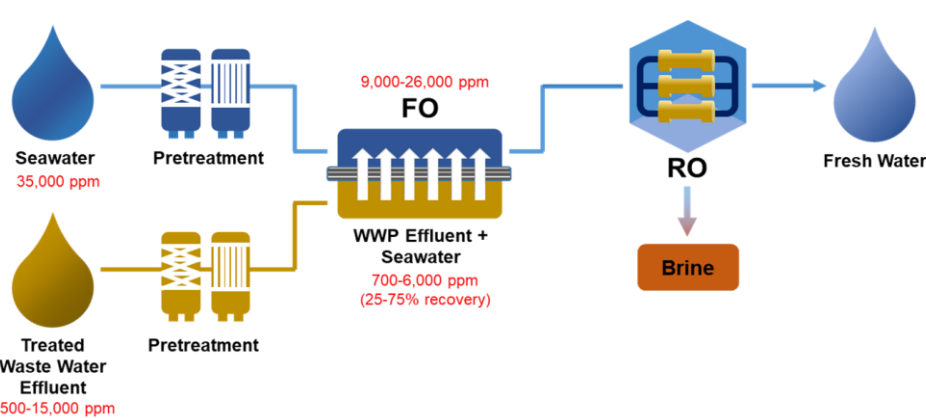
- Trace organic compounds (Antibiotics, Urea etc.)
- Toxic products (TMAH, boron etc.)

Process

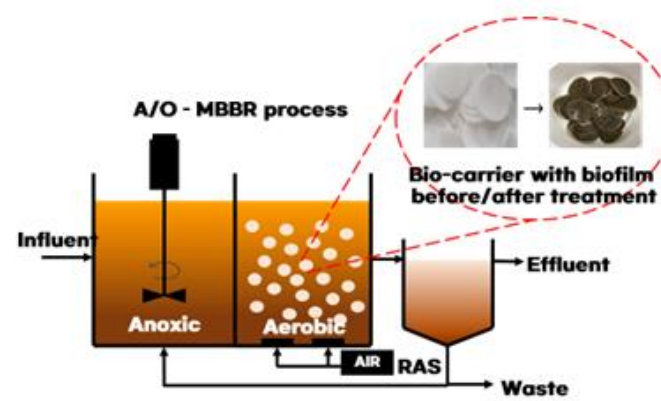
- Oxidation process (Ozone, Chlorine, UV etc.)
- Adsorption process (Metal-organic-framework etc.)

Process 1 Water Reuse

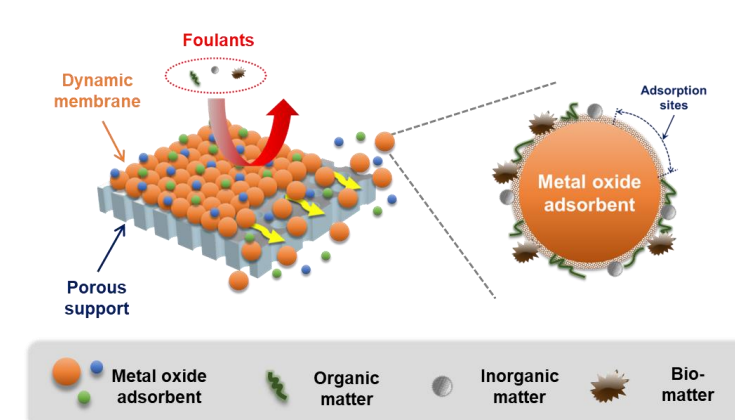
- Securing water resources from wastewater
- Membrane, biological and oxidation process for ultra pure water reuse



Forward osmosis (FO)



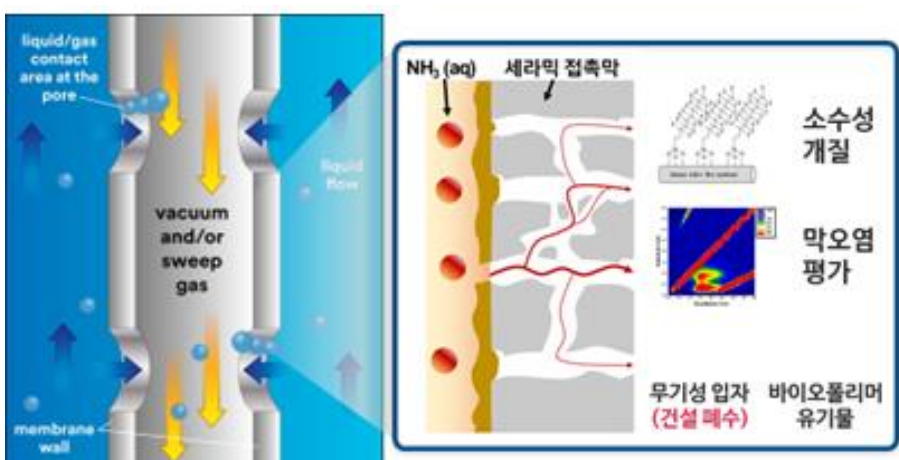
Moving Bed Biofilm Reactor (MBBR)



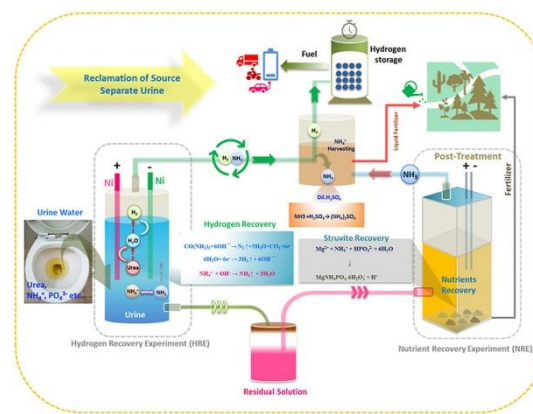
Dynamic membrane (DM)

Process 2 Resource Recovery

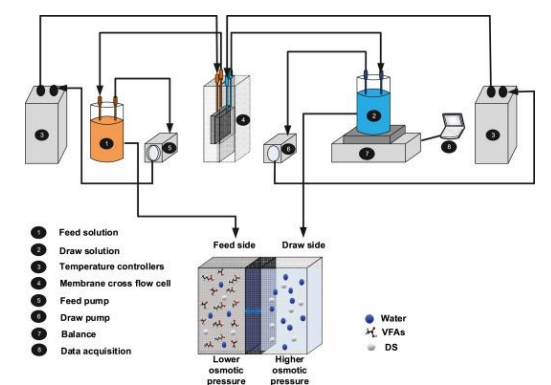
- Resource recovery for fertilizer or green ammonia from wastewater
- Valuable source recovery using membrane and electrochemical process



Membrane contactor (MC)



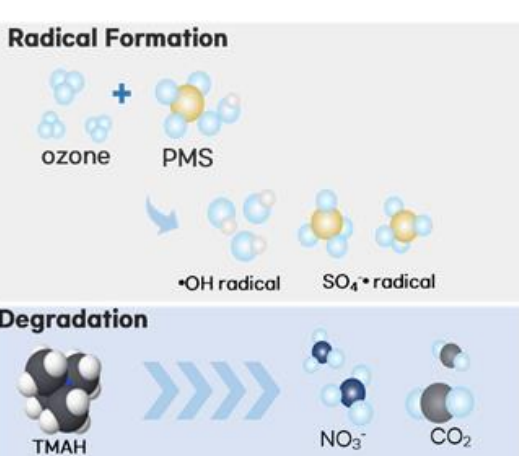
Electrochemical process



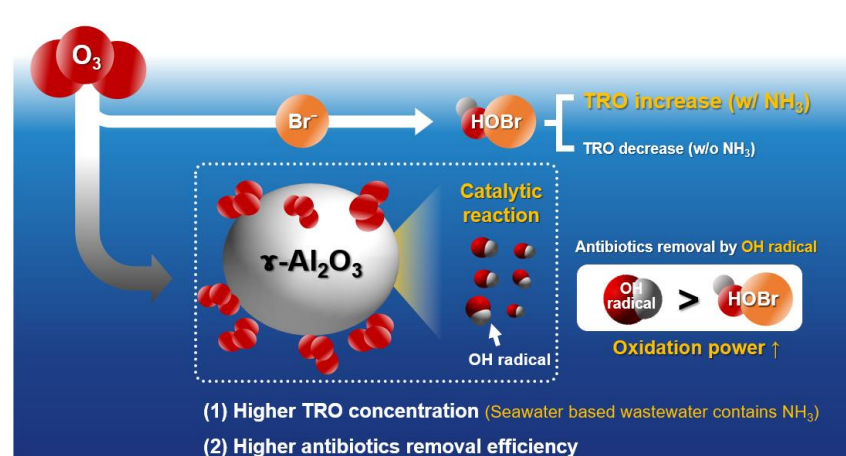
Forward osmosis for concentration

Process 3 Water Purification

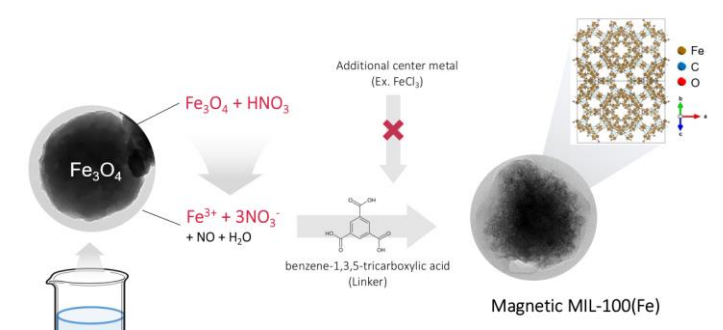
- Removal of micropollutant and toxic byproducts in wastewater
- Adsorption and oxidation process for high water quality



Advanced ozone process (Ozone+PMS)



Catalytic ozone process for seawater-based wastewater



Adsorption process (MOF, Metal oxide)