BOSON ALCHEMIES

Ammoniacal Nitrogen Treatment

Amines, Imines, Amides and Free Ammonia

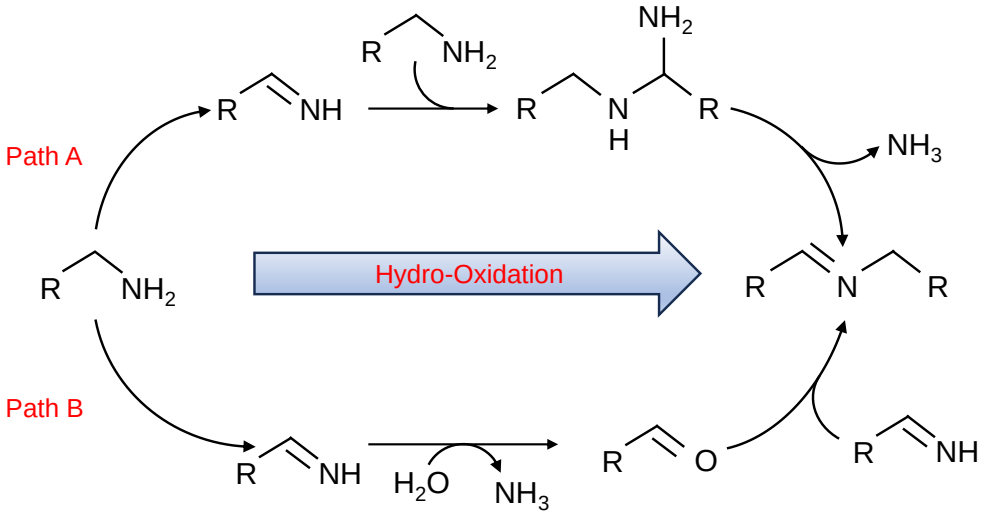
Why is Ammoniacal Nitrogen an Issue?

Are you currently experiencing any Ammoniacal Nitrogen issues in your effluent or your existing ETP?

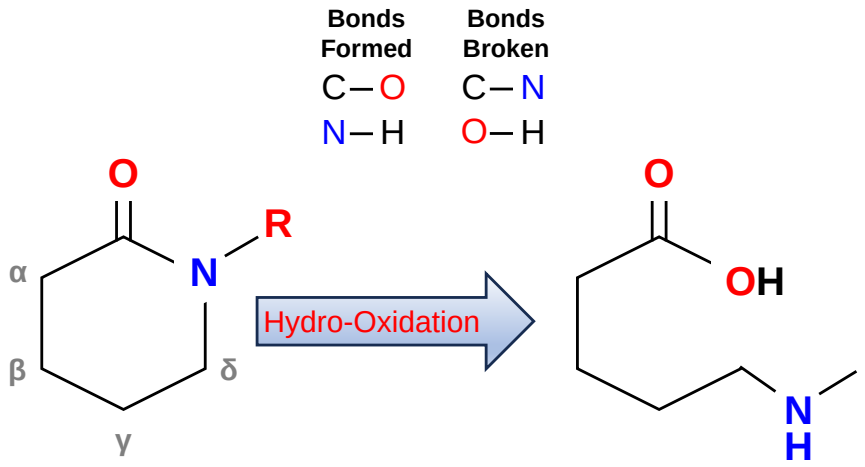
- When transitioning from liquid to gas, various forms of compounded Nitrogen molecules can be highly toxic to humans as atmospheric emissions
- The presence of Nitrogenous organic matter, specifically Ammoniacal Nitrogen, can disturb the ecological balance of microorganisms present in biologically-driven ETPs. Such organic matter tends to consume most of the available oxygen, thereby leaving lesser oxygen for COD degradation
- Due to the differing boiling points of nitrogenous organic compounds, some of them may skip the stripping stage and enter the MEE/MVRE Condensate, resulting in the condensate being unusable in its current state
- Loosely bonded nitrogenous organic compounds, if not entirely degraded, can react with other available matter in ETPs, forming transient compounds that further complicate the fluid's chemistry to be treated.

What is the impact of Boson Alchemies MHO Forced Oxidation Systems on Ammoniacal Nitrogen?

Boson Alchemies has engineered a wide assortment of catalysts. For NH3-N treatment, a unique grade of catalyst has been developed with the ability to immobilize nitrogenous compounds once released into the fluid. Following immobilization, a complementary catalyst forms ligands around the nitrogenous compounds, which become highly receptive to OH3- (a high potential oxidative radical) released by another set of catalysts. The result is the oxidative breakdown of the nitrogenous compounds into simpler elements and compounds such as N2, O2, CO2, and H2.



Degradation of AMINES



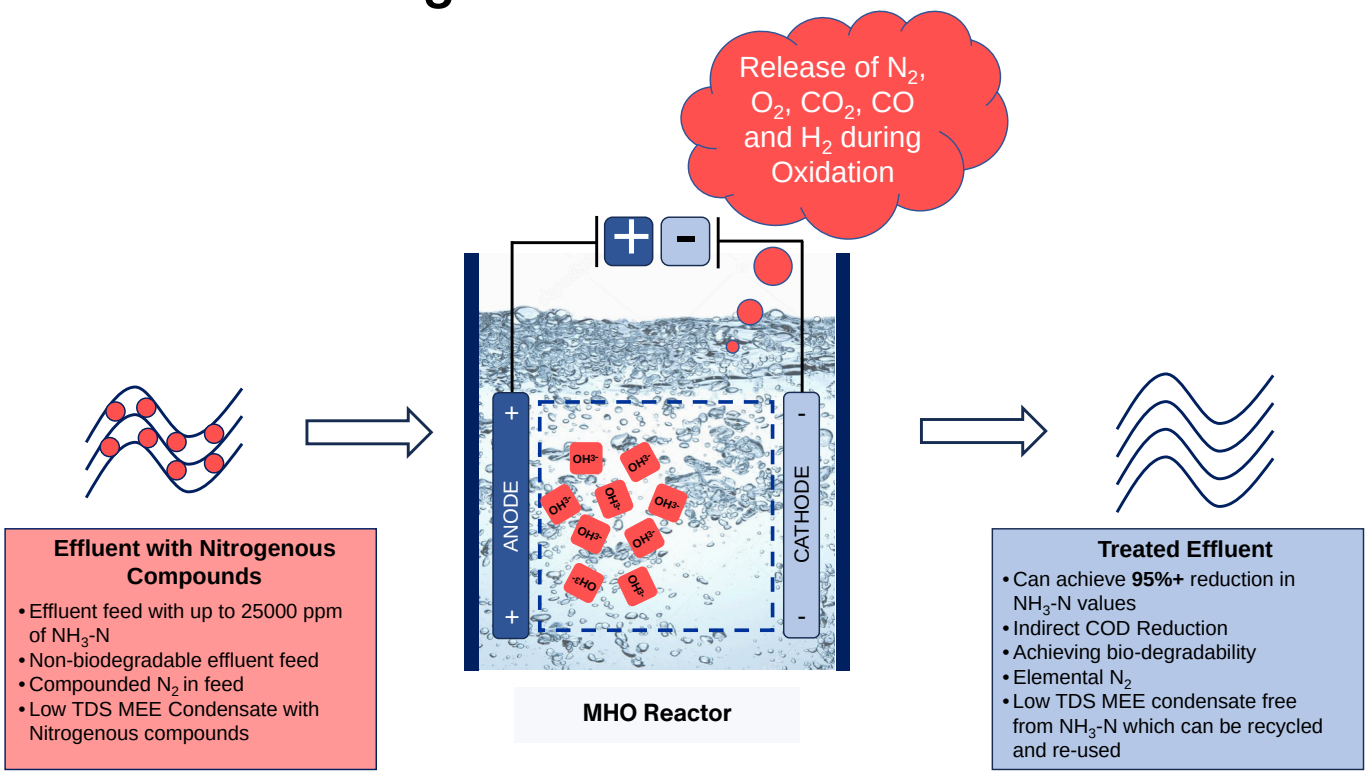
Degradation of AMIDES by targeted cleaving of the stable benzene ring

This methodology targets nitrogenous compounds, including amines, amides, and imines, for comprehensive oxidation-degradation.

Benefits

- Complete degradation of nitrogenous compounds to simpler elements / compounds such as N2, O2, CO2, H2 etc
- Enables consistency of feed acceptable feed into downstream biological ETP
- Avoids phase change facilitated air pollution
- These systems can completely make nitrification & de-nitrification process obsolete

Process Flow Diagram



Effluent with Nitrogenous Compounds

- Effluent feed with up to 25000 ppm of NH_3-N
- Non-biodegradable effluent feed
- Compounded N_2 in feed
- Low TDS MEE Condensate with Nitrogenous compounds

MHO Reactor

Treated Effluent

- Can achieve **95%+** reduction in NH_3-N values
- Indirect COD Reduction
- Achieving bio-degradability
- Elemental N_2
- Low TDS MEE condensate free from NH_3-N which can be recycled and re-used

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Target Industry

- Specialty Dyes, Pigments & Paints (Paper Dyes included)
- Pharmaceuticals / API Manufacturing
- Food & Beverage Industry
- Hydrocarbon processing Industries
- Specialty Chemicals (Largely aromatics – perfumes & essence)

Capacity & Footprint

MHO oxidation reactors utilized for Ammoniacal Nitrogen removal are designed to be compact, given that the residence/treatment time ranges from 10 to 60 minutes.

Typical wastewater treatment systems are unable to process effluents with elevated levels of ammoniacal nitrogen as the MLSS (mixed liquor suspended solids) cannot thrive in such conditions, thus rendering any size comparison moot.

Compared to conventional systems, our MHO reactor installations require significantly less space - less than 10% - and can be easily installed as mulitple modules for capacities exceeding 100 KLD.

About Us

Boson Alchemies as the name implicates- technologies and advancements of the future. We are ex-industry stalwarts with the purpose and vision of bringing specialized knowledge, value added products, services and solutions to you which will help your businesses grow and be profitable & sustainable.

Many of our process technologies are a result of Innovation, Process Development, Research and Strategic Technology Tie-ups with International Companies with R&D facilities having core expertise in the subject field. We have associations with many industry leading solutions and service providers to provide and end-to-end and seamless delivery for your needs.

Why Us

Having already supported over 120+ customers long term, we specialize in what we do. All our core capabilities, products and solutions are backed by our own knowledge and are developed inhouse and hence we are not dependent on any vendor or service provider to commit and deliver.

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