

Licensable Technologies

ChemDen-Nitrate Conversion Pilot Plant

Applications:

- Decontamination of natural waters
- Treatment of nitrate wastes produced by
 - chemical industry
 - metal industry
 - fertilizer manufacturing
 - agriculture
 - dairy farming
 - mining
 - defense industry
 - nuclear power generation
 - sewage treatment

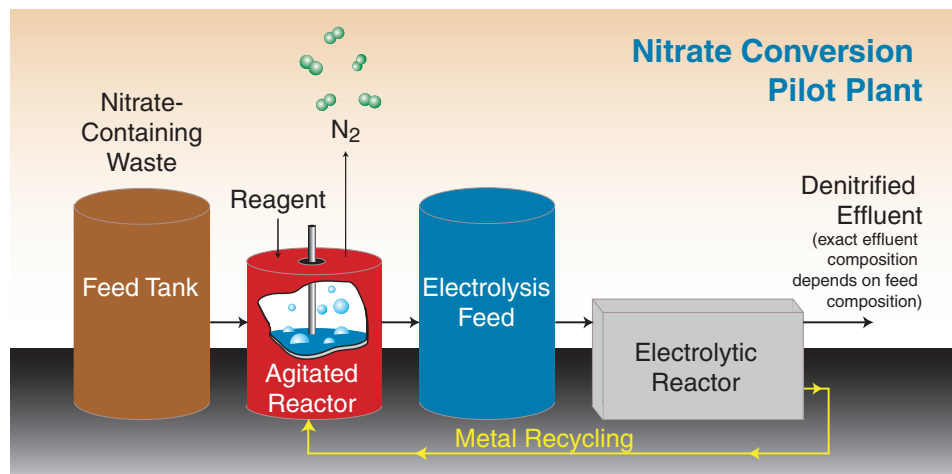
Benefits:

- Environmentally friendly
- Fast relative to biodegradation
- Performs at ambient temperature and ambient pressure
- More reliable than other physiochemical treatment methods

Contact:

Laura Barber, 505-667-9266,
ljobb@lanl.gov

tmt-2@lanl.gov
Technology Transfer Division



Summary:

The chemical, metal, mining, and farming industries all generate nitrate wastes harmful to humans and the environment if not disposed of properly. When nitrate waste contaminates a natural body of water, it causes excessive biological activity, vegetation growth, and precipitation of organic residue to the bottom. Excessive nitrate concentrations can transform healthy bodies of water into decaying marshes. Nitrate contamination in drinking water can cause a toxic change in the blood, particularly detrimental to infants and nursing mothers. The only commercially established method for nitrate destruction is biological degradation, which is limited by its slow reaction rates and inability to operate at high nitrate concentrations.

LANL scientists have developed a non-thermal and non-biological process (ChemDen™) for converting nitrate waste into harmless nitrogen gas. The method relies on transition metals and sulfamic acid to reduce nitrates to gas that is released to the atmosphere. The method, proven to work effectively on a wide range of nitrate concentrations, can operate continuously or in batches and is capable of reducing nitrates in highly concentrated waste streams containing up to 100 g/l of nitrate to a few parts per million.

Development Stage:

Demonstrated at bench and pilot scale. Permits established and implemented at the Los Alamos Wastewater Treatment Plant with 75-liter batch scale treating wastewater containing on average 51 g/l of nitrate.

Patent Status:

U.S. patent 6,030,520 Corresponding international protection filed in Canada, Japan, Korea, and Europe

U.S. patent 6,436,275 International rights for this patent are not available

Licensing Status:

UC/LANL is actively seeking an industrial partner to license and commercialize the process.

www.lanl.gov/partnerships/license/technologies/

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