



New Catalyst Reduces Energy Demand, Costs for Water Purification

Increases contaminant removal compared to existing commercial catalysts

Eltron has developed a family of catalysts designed for destruction and low temperature removal of high chemical oxygen demand (COD) and biological oxygen demand (BOD) materials in water. Experimental results for our patent pending catalytic wet-air oxidation (CWAO) methodology have shown 100% destruction of organic compounds in water at temperatures from 70°C to 150°C and pressures as low as 135 psig. Catalytic activity for significant destruction of organics was also demonstrated at ambient temperature and pressure.

Ethanol, acetic acid, amino acids (glycine, aspartic acid, arginine), and saccharides (glucose, lactose, starch) were used as target contaminants for evaluating catalyst performance. The total organic carbon (TOC) was measured as a function of time, temperature, and pressure.

Features and Benefits

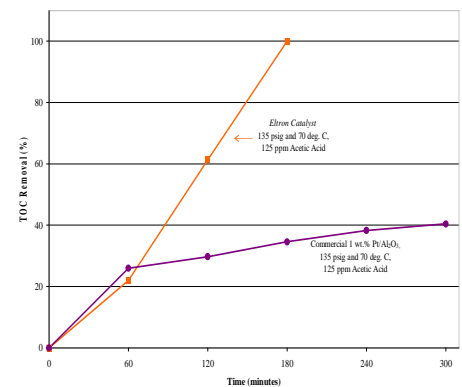
Eltron's technology enables better contaminant removal at lower pressures and temperatures than legacy technology, lowering the operating costs. Eltron's catalyst material also costs much less than those used in traditional oxidation technologies.

CWAO is used to purify municipal and residential water, and wastewater from industries such as pulp and paper mills, breweries, and chemical processing plants. These materials could also be used for remediation or daily clean-up of industrial waste streams from refineries, coke ovens, organic compounds production facilities, pharmaceutical factories, and many other sources. The technology will also effectively remove chemical and biological warfare agents accidentally or maliciously introduced into water supplies.

Variation in test conditions employed by various laboratories make it difficult to directly compare results from different catalyst systems. However, Eltron's catalysts out-performed commercial catalysts in side-by-side tests. Recent literature reports for precious-metal supported on mesoporous silica showed some activity at room temperature and pressure, though approximately 1.4 kg (2 L) of catalyst would be needed to produce 220 lbs. of water, enough for a crew of four for one day.

Eltron CWAO advantages:

- Total destruction of organic compounds
- Less severe operating conditions reduces capital and operating costs
- Reduced catalyst cost due to the absence of expensive metals
- Outperforms commercial catalysts in side-by-side tests



Eltron's Catalytic Wet Air Oxidation (CWAO) catalyst activity compared to commercially available aluminum supported platinum.

The amount of Eltron catalysts necessary to produce the same amount of water at ambient temperature and pressure is 0.166 kg (0.1 L), a significant decrease in size and a critical consideration in spacecraft applications.

Applications

Wastewater production is an ongoing concern due to increasing populations, industrialization, urbanization and agriculture. In response, wastewater production regulations have become more stringent. Common wastewater remediation systems including wet air oxidation (WAO) and supercritical wet air oxidation (SWAO) require high temperatures and high pressures. Such extreme operating conditions result in very high operating costs.

Eltron's CWAO materials can be applied to waste streams from refineries, coke ovens, organic chemical production facilities, pharmaceutical factories, pulp and paper mills, and produced water.

Stage of Development

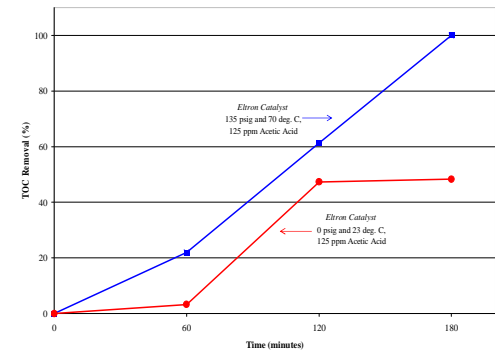
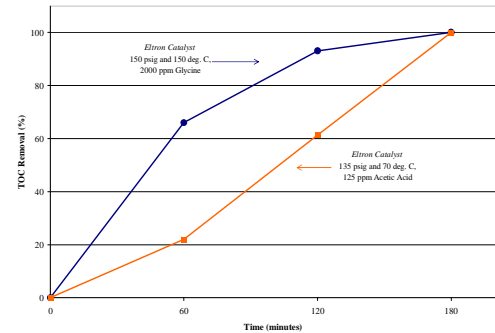
Eltron has achieved proof of concept of this technology. Eltron has significantly developed these materials but no work has been done on a commercial reactor design. However, it is anticipated that existing reactor geometries can be used. Catalyst materials cost between \$2-10/lb depending upon treatment requirements and conditions. Sample materials can be provided to interested customers or commercialization partners.

The technologies described, and all related inventions are owned by Eltron Research & Development Inc, and protected by copyrights, trademarks, issued and pending patents, trade secrets, or other applicable intellectual property rights.

Contact us

To learn more about catalysts wet air oxidation methods being developed at Eltron Research & Development, visit www.eltronresearch.com.

To discuss the possibility of entering into a business relationship with Eltron, contact the Business Development Group at business@eltronresearch.com.



Eltron's Catalytic Wet Air Oxidation (CWAO) catalyst activity at various reaction conditions and contaminants.



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