



Salgenx

topics

Salt Water Flow Battery Topics

3/29/2023

608-238-6001 [TEL]

greg@salgenx.com [Email]



This webpage QR code

Structured Data

```

<script type= "application/ld+json">
  {
    "@context": "http://schema.org",
    "@graph": [
      {
        "@type": "Organization",
        "@id": "https://salgenx.com/#organization",
        "name": "Salgenx",
        "url": "https://salgenx.com",
        "sameAs": [
          "https://www.instagram.com/salgenx/",
          "telephone": "608-238-6001",
          "email": "greg@salgenx.com",
          "logo": "https://salgenx.com/logo.png"
        ]
      },
      {
        "@type": "WebSite",
        "@id": "https://salgenx.com",
        "url": "https://salgenx.com",
        "name": "Salt Water Flow Battery Topics",
        "description": "Salt Water Flow Battery Topics."
      },
      {
        "@type": "NewsArticle",
        "mainEntityOfPage": {
          "@type": "WebPage",
          "@id": "https://salgenx.com/topics.html",
          "headline": "Salt Water Flow Battery Topics",
          "image": "https://salgenx.com/images/metal-tank-container.png",
          "datePublished": "2023-03-29T08:00:00+08:00",
          "dateModified": "2023-03-29T09:20:00+08:00",
          "author": {
            "@type": "Organization",
            "name": "Salgenx",
            "url": "https://salgenx.com"
          },
          "publisher": {
            "@type": "Organization",
            "name": "Salgenx",
            "logo": {
              "@type": "ImageObject",
              "url": "https://salgenx.com/logo.png"
            }
          }
        }
      }
    ]
  }
</script>

```

Salt Water Flow Battery Topics.

PDF Version of the webpage (first pages)

3D Tank Printing

One of the more advanced technologies which can be deployed for local electrolyte liquid tank storage is using concrete 3D printing.

There are several advantages of using 3D concrete printing technology for making liquid tank storage. Some of these advantages are:

Customizability: 3D concrete printing allows for greater design flexibility and customization compared to traditional manufacturing methods. This means that liquid tank storage can be designed to fit specific project requirements and site conditions, resulting in a better fit and potentially reducing construction time and costs.

3/29/2023

New Technology Projects for Infinity Turbine and Salgenx

1. Salflowx.com will be our dedicated site for modular electrolyzer stacks.
2. Flowbladex.com is our dedicated site for our modular electrolyzer blades for sale, maintenance, parts, and service.
3. Salturbinox.com will be our CO2 turbine with Salgenx energy and thermal storage incorporated into the container mounted system.
4. Ecoearthx.com will be our Green Ammonia site which will present our on-demand-nitrogen-from-the-air micro processing plant. Identified as one of the three pillars of the Earths tipping point (electric vehicles, green ammonia fertilizer production, and green protein products).
5. Saljetx.com will be our dedicated jet turbine site which will use CO2 working fluid in harmony with the Salgenx mobile and airborne battery system.
6. Desalx.com will be our dedicated brine and seawater desalination site, which harmonizes the Salgenx battery to work with marine based wind turbines to make both fresh water and energy storage. The system can also be used on cruise ships and cargo ships. Applications include military EABO (Expeditionary advanced base operations).

Updated March 2023.

Liquid Electrode

Under development is using centrifugal adhesion and flow dynamics to contain catalyst as an alternative to plating solid, porous, or flow-through electrodes.

This method is a game changer since little to no electrode manufacturing or preparation is needed. Maintenance free and easy to replace. Coded material can be time referenced for born-on and expiration or replacement date.

Almost any catalyst can be used. This is perfect for just-in-time experimentation and battery manufacturing since there is no time lag if preparing electrodes from a supplier.

We first used this to make a proof-of-concept to make hydrogen (H₂) in water electrolysis. H₂ production was actually increased using this process, compared to standard electrode and electrochemistry.

Active Laser Ablatement

Under development is using a light sensitive catalyst electrode to provide electrolysis.

Spices May Provide Way to Eco Friendly Electrodes

Recent studies on using spices to reduce or eliminate dendrites in legacy battery systems may provide the link to eco friendly electrode coatings.

The same antioxidant qualities that spices have for humans, have equally novel applications for electrolyzers, increasing efficiency and lower costs simultaneously. More data will be released after we get our intellectual property secured.

With the ability to have salt water for one electrolyte, and a organic solution for the other, along with novel spice coated electrodes, Salgenx is gearing towards the most eco friendly green battery system on the planet.

Best of all, local battery businesses will be able to manufacture batteries for homes, businesses, and grid sized power storage, eliminating the need for time consuming and costly shipping.

How the Salt Water Flow Battery Works

Operation:

1. An aqueous solution of NaCl is set in a tank and an organic liquid with high solubility of Chlorine gas and low miscibility in water is set in another tank.
2. Exits from these tanks flow in separate tubing and a pump sets the flow rate for each phase.
3. These two separate flows enter into a single flow (the reaction zone of the cell) and the flows will pass through and over their respective electrodes. The exit of these cells will be a flow combining the two flows. [Proprietary Device] separates the two flows and they return to their respective tanks.
4. After a steady state operation is achieved, the battery applies the voltage being provided from the power source. The battery is now charging and chlorine gas is being produced in the solution.
 - A. On the working electrode, [Proprietary catalyst] particles promote the well researched Chloride/Chlorine oxidation. Chloride ions from the NaCl aqueous solution oxidize into chlorine gas. This gas is then stripped from the aqueous phase by the organic phase.
 - B. On the counter electrode sodium ions are ejected from an active electrode of [Proprietary catalyst] into the aqueous solution and the electrode transitions to [Proprietary catalyst]. This boosts the average cell voltage from 1.3V to 1.8V
5. State of charge (SOC) is tracked by an inline concentration sensor of the organic phase. Once it reaches between 90-95 percent of its solubility limit of Chlorine gas the battery is considered charged. Pumping operation could cease. At no point is Chlorine gas outside of the closed loop system. A Chlorine sensor is provided and communicates instantaneously to command and control processor. In the case of a power failure, the system is flooded with NaCl to neutralize any Chlorine.
6. The energy storage of this design comes from a large amount of trapped Chlorine gas and dissolved sodium ions. Due to the separation of the tanks, discharge over time should be incredibly limited.
7. During discharge, the pumps are turned back on and a steady state operation is achieved. Then an opposite voltage is applied and the dissolved chlorine gas returns to chloride ions and the discharge is started.
 - A. On the working electrode, dissolved chlorine gas reacts on the [Proprietary catalyst] particles back into chloride ions. The low solubility of chloride in organic phases means these ions readily return to the aqueous phase. This is a safety factor which is inherent to the closed-loop system.
 - B. On the counter electrode sodium inserts back into the active material of the electrode.
8. Once again State of Charge (SOC) is tracked by the now diminishing Chlorine concentration in the organic phase. Once it reaches 0-5 percent of its charged value, the battery is considered discharged. Pumping operation ceases.

Electro Vortex Flow Electrodes

Salgenx is currently investigating using vortex flow for electrode cell dynamics. Similar to a spinning disc reactor, this enhances efficiency while providing a more robust and simple reaction with less parts.

Flow Evolution

One of the interdisciplinary subjects we're also focussing on is the evolution of flow. We've had lots of experience with CO₂ flow dynamics and other Organic fluids, and want to stress the importance of flow dynamics with a flow battery system.

Monetize the Tax Credit

Manufacturers can also monetize the tax credit through a direct payment from the Internal Revenue Service (IRS) in lieu of a credit against their taxes due, or opt to transfer the credit, as described below:

Direct pay option: Manufacturers can receive a refund for 45X MPTC tax credits for the first five years they are claimed, though are still subject to the 2033 credit sunset. The five-year limitation does not apply if the manufacturer is a tax-exempt organization (i.e. non-profit), state, municipality, the Tennessee Valley Authority, Indian Tribal government, any Alaskan Native Corporation, or any rural electric cooperative. A penalty of 20% may apply where excess payments occur.[3]

Transfer of credit: Manufacturers may also elect to transfer all, or a portion, of the tax credits for a given year to an unrelated eligible taxpayer. Payments for the credit must be made in cash and are not considered a taxable event (i.e. no taxes are owed on receiving the payment and no deduction is possible for making the payment). A penalty of 20% may apply where excess credits occur.[4]

[3] H.R.5376 – Inflation Reduction Act of 2022, Section 6417. Taxpayers may elect to stop receiving direct payments in subsequent years, however, once stopped, they cannot go back to direct payments.

[4] H.R.5376 – Inflation Reduction Act of 2022, Section 6418. The transferee cannot further transfer any credits it received in the transfer.

Salt Water Battery Publications

Below is a link for a variety of salt water battery publications.

If you want to learn more about saltwater batteries and the technology, please look through the scientific papers.

[Salt Water Battery](https://salgenx.com/search/salt-battery/index.html)

[Curcumin Battery](https://salgenx.com/search/curcumin-battery/index.html)

[Redox Flow Battery](https://infinityturbine.com/search/redox-flow-battery/index.html)

[Sodium Battery](https://infinityturbine.com/search/sodium-battery/index.html)

[Electrode](https://salgenx.com/search/electrode/index.html)

[Electrode](https://salgenx.com/search/swing-absorption/index.html)

As a simultaneous Thermal Storage Device

Considered a hybrid between a standard flow battery and a thermal storage device, the battery provides simultaneous heat or cold liquid storage as well as electrical energy storage.

The Cogen Battery has a variety of applications which include:

- storage of thermal energy (heating or cooling) from unused thermal resources
- storage of electrical power for backup power and grid strength
- utility grid power rate mining opportunities to store off-peak low cost power for later use during demand (on-peak) hours
- storage of thermal energy for Organic Rankine Cycle (ORC) power production while simultaneously storing the electrical output from the turbine generator
- using off-peak low cost power to make heating and cooling for later use
- reducing peak demand utility rates by peak energy shaving

Heat Pump

A heat pump is almost exactly like a ORC (Organic Rankine Cycle) system, which uses phase change to provide work to produce heat or cooling.

In the case of a ORC system, the pressure reducing valve is replaced with an expander which mechanically rotates a electrical generator to make power.

A heat pump has a high COP (Coefficient of Performance - is defined as the relationship between the power (kW) that is drawn out of the heat pump as cooling or heat, and the power (kW) that is supplied to the compressor) when compared to resistance heating.

We have also been able to have a high COP with our cavitating discs in liquids that cavitate (water, CO₂, and refrigerants).

The advantage of a heat pump is that you can use off peak power to produce heating or cooling into a liquid, and then use that thermal resource during the on peak hours for huge cost savings. We term this utility grid price arbitrage.

What is Brine

What is brine?

In general, brine is any solution with an extremely high concentration of salts, such as sodium chloride, which can occur either naturally (as with seawater, deep-water ocean pools, salt lakes, producer water from oil and gas drilling) or as a byproduct of industry. These byproducts, or brine waste streams, are typically highly concentrated salt solutions that, in some cases, contain more than twice the amount of concentrated salts than natural brine solutions. Brine waste streams can also be highly concentrated with total dissolved solids (TDS), such as waste streams in many chemical manufacturing processes, and they can be some of the most challenging to treat or discharge because their composition and purification requirements are dynamic and complex.

Some examples of brine waste created as a byproduct of industry include:

- cooling tower and boiler effluent
- reverse osmosis (RO) and ion exchange waste/reject streams
- produced water from extracting oil and natural gas
- chlor-alkali and chemical plant waste
- acid rock and mine drainage
- food preservation and manufacturing waste streams
- desalination waste from potable water creation
- irrigation runoff

Our novel solution is treating this solution considered an expensive headache, into a battery technology system. Elon Musk and Tesla even think that recovery of lithium from brine is worth patenting. However, they are not the first to do so. (1962 Lithium from Brine Patent)

NACS Tesla Plug for Charging AC and DC

Salgenx will be offering the NACS Tesla plug as part of its connectivity options to allow direct charging of electric vehicles.

From @Teslamotors #Tesla: With more than a decade of use and 20 billion EV charging miles to its name, the Tesla charging connector is the most proven in North America, offering AC charging and up to 1 MW DC charging in one slim package. It has no moving parts, is half the size, and twice as powerful as Combined Charging System (CCS) connectors.

Tax Credits Waiting List

If you have battery tax credits to sell, or would like to be put on a tax credits available for purchase waiting list, please send us an email.

We anticipate having a minimum of \$60 million worth of credits available by the end of 2023 from our various license holders and manufacturers.

Levelized Cost of Storage LCOS

The superiority of Salt Water flow chemistry: lower levelized cost of storage (LCOS).

Utility Scale

The flexibility of large scale battery storage for wind and solar will prioritize grid stability. Salgenx salt water flow batteries meet these criteria with safe and nontoxic technology that is easier to site and permit than the competition with less maintenance and lower acquisition costs.

Micro grids, DERMS and VPPs

Distributed energy resources to maximize capacity, backup, and stability are a must. Stand-alone micro grids, oil and gas, or utilities balancing DERs all present ideal use cases for Salgenx salt water flow battery technology.

Commercial and Industrial (C&I)

Rapid growth in energy storage for commercial and industrial sites have been forecasted by industry experts. With Salgenx long-duration energy storage, you can manage demand charges and time-based rates while ensuring energy security. Buy low off-peak power and use during peak-demand.

Binder-Free Electrodes Synthesis for Electrochemical Energy Storage Application

Part of our commitment for advanced energy storage, we have been working on binder free electrodes for a few years now.

The ramifications of this technology will allow greater experimentation, efficiency, and maintenance of flow battery electrodes.

This research and deployment will be part of our yearly updates for licensee holders of our salt water flow battery technology.

The speed of which this is progressing will lead us to putting this under the trade secret category and not into the slow and exposure in the worldwide patent process.

3/29/2023

Saltwater Battery

The Salgenx saltwater battery is a flow battery system, which requires two large tanks that hold fluid electrolytes. One tank is dedicated to salt water (just add NaCl to water). The saltwater tank may be used for thermal storage.

Fluids are circulated through electrodes, which regulate the input and output of electricity from the battery.

The battery does not use a membrane, which is common on other redox flow battery systems. The absence of the membrane saves huge up front purchase costs, maintenance, and consumable expenses.

The amount of electrolyte flowing in the electrochemical stack at any moment is rarely more than a few percent of the total amount of electrolyte present (for energy ratings corresponding to discharge at rated power for two to eight hours). Flow can easily be stopped during a fault condition. As a result, system vulnerability to uncontrolled energy release in the case of Vanadium or Bromine is limited by system architecture to a few percent of the total energy stored.

The energy capacity is a function of the electrolyte volume and the power is a function of the surface area of the electrodes.

Forced Learned Electrode

Part of our commitment for advanced energy storage, we have been working on intelligent electrodes for a few years now. The advancement of this technology will allow greater variability, efficiency, and performance of flow battery electrodes.

This research and deployment will be part of our yearly updates for licensee holders of our salt water flow battery technology.

The speed of which this is progressing will lead us to putting this under the trade secret category and not into the slow and exposure in the worldwide patent process.

What is a forced learned electrode ? It's a new paradigm in electro-chemistry that uses first principles to make working electrodes that are not static. It's a hybrid between biofeedback and energized fields that rapidly decrease development time and dramatically increase velocity of deployment to market.

