



Acid, Caustic, and Dissolution Chemistry Alternatives

Shotwell Hydrogenics provides technically advanced and environmentally responsible chemicals to the oil and gas industry. In an industry that is placing a greater emphasis on health and safety, Shotwell's products are preferred. O&G's technical success and leadership in adopting alternatives are attracting other industries looking to embrace replacements for hazardous chemical methods.



INDUSTRY OPPORTUNITIES FOR ACID ALTERNATIVES

Shotwell's products are designed to replace hazardous chemicals, including hydrochloric and sulfuric acids, sodium hydroxide, and other mineral dissolution chemicals. There are many technical, safety, transportation, and environmental advantages associated with these replacement products in the following areas:

ACID ALTERNATIVES

Non-hazardous and effective alternative to hydrochloric acid and other organic and inorganic acids, including citric acid alternative options.

CAUSTIC ALTERNATIVES

Non-hazardous and effective alternatives to caustic soda for linear/controlled fluid buffering and low freeze point.

MINERAL DISSOLVER CHEMISTRIES

Safe and effective chemistries for the dissolution of tough deposits such as barium and strontium scales along with calcium and iron sulfide deposits.

CORROSION INHIBITORS AND ACCELERATORS

Packages suitable for mineral and organic acid systems and include propargyl alcohol and formic acid free options.

APPLICATIONS

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| • Acid stimulation on older wells | • Acid stimulation on new wells | • Re-frac on older wells |
| • Cleans near-bore at perforations in vertical wells | • Treatment of injection wells | • Coil tubing clean-outs |
| • Opens new fractures and flow paths in open hole and slotted, linear horizontal wells | • Surface cleaning of heat exchangers, boilers, etc. | • Release stuck tools, pumps, etc. |
| • Removing deposits and opening new fractures and flow paths | | |
| • Removal of tough scales such as strontium and barium from surface equipment and downhole | | |
| • pH adjustment in mud systems and other applications | | |

PRODUCT HIGHLIGHTS

PRODUCT	DESCRIPTION	APPLICATIONS
GREEN ACIDS		
<ul style="list-style-type: none"> SHGA-9100 	<p>Unreacted HF donor. Activated by SHGA-9600 resulting in the fluoride ion being released and thus exhibits all the dissolution characteristics of HF acid.</p>	<ul style="list-style-type: none"> Downhole in sandstone formations where silica is present. Other HF applications such as acid-mud systems.
<ul style="list-style-type: none"> SHGA-9300 	<p>Strong (21% HCl equivalent), odorless, non-oxidizing, nonvolatile acid, alternative with zero halogens and will not produce chlorides.</p>	<ul style="list-style-type: none"> Ideal for applications where a strong acid is required and high temperatures or exotic metals are exposed (chrome, aluminum) Cleaning of exchangers, pumps, etc. that contain soft metals such as aluminum, chrome, nickel, etc.
<ul style="list-style-type: none"> SHGA-9400 	<p>High performance NORM descaler designed to remove sulfite scale with the ability to dissolve large amounts of barium sulfate. It also reduces the size of the sulfate particles and limits reprecipitation.</p>	<ul style="list-style-type: none"> Where the scale contains strontium, barium and/or calcium scale including downhole or surface applications.
<ul style="list-style-type: none"> SHGA-9600 	<p>Low-hazard replacement for all HCl blends designed to be applied on high to ultra-high temperature applications. It provides optimal wormholing PVbt-opt efficiency vs HCl or other competitors.</p>	<ul style="list-style-type: none"> Can be used in acid fracturing, matrix stimulations or spearhead applications. The lower interstitial velocity allows for the reduction in the requirements for high injection rates typically utilized with HCl. Treatment of low-permeability, high calcite formations.
<ul style="list-style-type: none"> SHGA-9700 	<p>Low hazard replacement for HCl that has comparable reaction rates to 15% HCl (at a 33% dilution).</p>	<ul style="list-style-type: none"> During pump-downs as a spearhead acid in lower temperature applications. Low temperature scale removal in piping, heat exchangers, boilers, etc.
<ul style="list-style-type: none"> SHGA-9800 	<p>Concentrated Citric Acid replacement</p>	<ul style="list-style-type: none"> Downhole acid jobs and equipment clean-out.
<ul style="list-style-type: none"> SHGA-9804 	<p>An alternative to citric acid, SHGA-9804 is designed to function as a drop-in replacement. Citric acid has a very low calcium carbonate (or similar scale) dissolution loading, but SHGA-9804 has the same dissolution properties as a 7.5% muriatic (hydrochloric) acid solution, but with all the safety features of citric acid.</p>	<ul style="list-style-type: none"> SHGA-9804 is supplied as a field-ready RTU (ready-to-use) product of SHGA-9800. Add to the material to be cleaned (surface) or pumped down-hole and allow to soak. No neutralization step is required. For heavier build-ups, the product can be left on for longer periods, including overnight, without the concern for metal damage.

PRODUCT HIGHLIGHTS

PRODUCT	DESCRIPTION	APPLICATIONS
GREEN CAUSTICS		
<ul style="list-style-type: none">SHGC-9300	<p>Modified Alkali product that has comparable abilities of caustic soda w/o the hazardous exposure and corrosion properties.</p>	<ul style="list-style-type: none">Can be used in any situation where pH of the fluid needs to be adjusted (upwards) such as H₂S/CO₂ sequestration in drilling fluids, caustic scrubbers.Bitumen extraction, ASP water floods, enhance polymer hydration properties, degreaser/cleaning agent, and neutralizing agent.
CONVENTIONAL ACID ALTERNATIVES		
<ul style="list-style-type: none">SHAA-9100	<p>Intensifier that supports corrosion inhibition in low temperature applications.</p>	<ul style="list-style-type: none">Used with any conventional acid (H₂S, H₂SO₄, etc.).Can be used with any of the SHGA product line for additional protection.
<ul style="list-style-type: none">SHAA-9200	<p>Eco-Friendly, acid corrosion inhibitor that is effective for broad protection of common steels and alloys in high temperature applications up to 220°C (430°F).</p>	<ul style="list-style-type: none">Used with any conventional acid (H₂S, H₂SO₄, etc.).Can be used with any of the SHGA product line for additional protection.

Technical Data Sheets and/or Safety Data Sheets (SDS) are available upon request.

CONTACT US



LEADING-EDGE FACILITY

- ▶ Fully Automated
- ▶ ISO9001:2015 certified
- ▶ NSF certified



LOCATION

- ▶ Heart of Permian Basin
- ▶ 35,000 square feet
- ▶ Midland, Texas

**CONTACT US FOR MORE INFORMATION AT
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WWW.SHOTWELLHYDROGENICS.COM**



QUALITY

- ▶ Blend capability up to 57.6M gallons/year
- ▶ Stringent Quality Control and Quality Assurance Standards



SERVICE

- ▶ Reliable technical and lab support
- ▶ Transport Bulk and Non-Bulk containers to field