

Soy-Based Scale Inhibitor for the Oil and Gas Industry



Airable Research Lab, in partnership with LFS Chemistry, has developed a soy-based scale-inhibiting additive that prevents the buildup of calcium scale in water systems.

The oil industry has a significant need for scale inhibitors. When oil wells begin pumping, the water within the rock—which has high compositions of minerals—mixes with the water used to retrieve oil. The minerals are precipitated and deposited in the system. Scale is the term for these insoluble minerals that accumulate in water systems. Over time, these deposits grow and harden, preventing fluid from flowing through pipelines, valves, pumps, and other machinery. The result is slowed production—and, if the buildup is left unaddressed, damaged equipment.

Scale inhibitors are chemicals that prevent or slow the precipitation of scales. Although it is challenging to separate the environmental impacts of scale inhibitors from other drilling hazards, there are ongoing efforts to develop “greener” processes for inhibition.

TECHNOLOGY DEVELOPMENT

LFS Chemistry is a key player in this growing space. Founded in 2019, the company focuses on oil and gas (O&G) operations for the future green economy, providing uniquely formulated additives that reflect environmental, social, and corporate governance. LFS Chemistry reached out to Airable to develop a bio-based scale inhibitor.

Airable started with a proof-of-principle project, working within LFS Chemistry’s parameters to develop a customized product. The team identified a promising formulation and modified it to match the preferred characteristics more precisely. LFS Chemistry used both static and dynamic loop tests to evaluate the formulation, confirming that it significantly delays scale formation. The Airable team then scaled up the product, producing a soy-based alternative that inhibits mineral precipitation in wells, preventing restrictions and clogs.

Airable has transferred the technology to LFS Chemistry, which is using its 50+ years of combined executive leadership experience in O&G to commercialize this technology. The lab has also filed for a provisional patent for the formulation (details below).

HIGHLIGHTS

- Inhibition efficiency of 60%–80%
- Biobased formulation, with roughly 58% soy content
- Ready-to-use product
- Significant cost savings over commercial scale inhibitors
- Domestic feedstocks
- Highly miscible with water
- Strong shelf-life stability, even when exposed to thermal conditions of up to 75°C

PATENT INFORMATION

Title: Scale Inhibiting Method with Phosphated Natural Oils

Type: Provisional

Country: United States

Application Number: 63/362,169

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