

# A Method for Iron Control in Concentrated HCL During Carbonate Stimulation



## THE INVENTION

KFUPM researchers have developed a new method of iron control during the stimulation of carbonate reservoirs. This method comprise the use of a novel fluid system that stabilizes ferric ions without any precipitations and thus improves the efficiency and performance of the stimulation fluid.

## MARKET NEED

Controlling iron during acid stimulation is one of most challenging problems encountered in oil and gas industry due to the precipitation of ferric ions during the stimulation treatment. Specifically, the presence of ferric ions in the solution degrades the productivity of the production well and similarly results in loss of injectivity in the injection wells. Typically, in acid fracturing and acidizing, the acid concentration is 20%wt HCL but in aggressive stimulation jobs, may range between 25%-28%wt HCL. Existing iron control systems in the market can control iron in solution when using up to 20% HCL. However, higher HCL dosages require the use of corrosion inhibitors to mitigate the reaction of the acid on the pipe, which adds to the cost of the treatment. Another solution in the market is the combination of citric/acetic acid; however, this cannot handle high iron content. The global specialty oilfield chemicals market is expected to reach USD 14.10 bn by 2025, from USD 10.92 bn in 2017 growing at a CAGR of 4.1% during the forecast period of 2018 to 2025<sup>1</sup>. Specialty oilfield market is expected to witness significant growth over the next seven years owing to increasing application in drilling fluid activities, production chemicals and work over & completion.



## COMPETITIVE ADVANTAGE

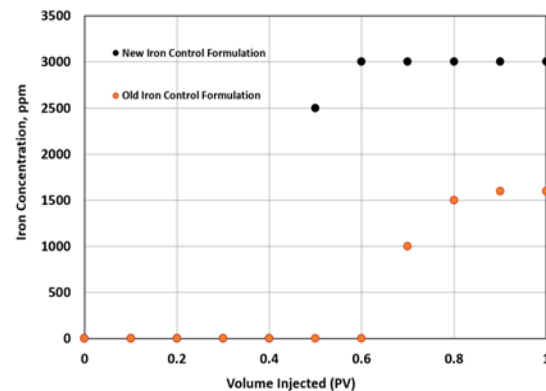
This technology offers the following benefits:

- Single-stage pumping with stimulation fluid in
- No effect on the stimulation performance.
- Non corrosive and environmental friendly
- Works at low pH

<sup>1</sup> <https://wiseawareness.com/specialty-oilfield-chemicals-market-analysis-market-size-market-growth-competitive-strategies-and-worldwide-demand-2024/>

## MARKET READINESS

This KFUPM technology is proven at laboratory scale. Of significance, the results from the solubility test performed indicate that the KFUPM solution is able to stabilize up to 3000 ppm of ferric ion in solution for high HCL concentration (28%) without precipitation. Furthermore, the herein KFUPM invention has four times capacity compared to the citric/acetic iron control formulation.



The iron concentration for the new formulation compared with the existing formulation (2.5 wt% acetic acid + 2.5 wt% citric acid) using ICP during the coreflooding experiments, 28% HCl

## PATENT PROTECTION

This invention is covered by patent application US16386468. This IP is owned by King Fahd University of Petroleum & Minerals (KFUPM).

## LOOKING FOR A DEVELOPMENT PARTNER

KFUPM seeks an industry partner to validate this technology in relevant environment and ultimately for possible commercialization.

## ABOUT KFUPM

King Fahd University of Petroleum & Minerals is a leading educational organization for science and technology. KFUPM Innovation & Technology Transfer office is tasked with taking innovation from lab to market.

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