

HYDROGEN SULFIDE SCAVENGER FOR DRILLING HORIZONTAL AND MULTI LATERAL RESERVOIRS



THE INVENTION

The subject technology is a drilling mud additive that forages hydrogen sulfide that evolves during drilling in sour gas and oil wells. This new drilling fluid composition comprising H₂S scavenger is suitable for drilling horizontal and multi-lateral wells in sour formations.

MARKET NEED

Hydrogen sulphide (H₂S) is a toxic gas that poses significant challenges in oil and gas industry. H₂S scavengers are chemical compounds that are typically developed to remove H₂S gas. These scavengers eradicate the H₂S from the upstream and downstream to reduce corrosion.

The market segment is divided into the Regenerative and Non-Regenerative H₂S scavengers. The global Hydrogen Sulfide Removal market was valued at 2039 million USD in 2016 and is expected to reach 2240 million USD by the end of 2023, growing at a CAGR of 1.04% between 2018 and 2023¹. Middle East & Africa and North America are the main consumption regions. In 2016, North America revenue is 567 Million USD, Occupy 27.8% of global market.

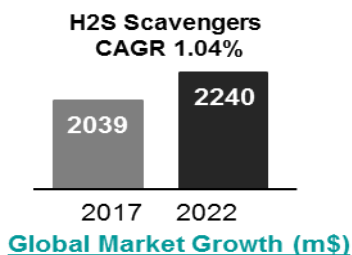


Fig .1 Global Hydrogen Sulfide Removal Market (Source- QYR Research)

PATENT PROTECTION

The technology is covered by patents US10301524, US10501676, US10479919, SA520411565. IP is owned by King Fahd University of Petroleum & Minerals (KFUPM).

ADVANTAGES

- Low cost drilling additive for H₂S scavenging
- Enhanced (3x) sorption capacity to H₂S compared to conventional Thiazine fluid (5143 mg H₂S/ml compared to 1666 mg H₂S/ml)
- Reduces hydrogen sulfide to zero-valent sulfur for easy filtration (during filtration step)
- Onsite regeneration of the working fluid by treating the spent effluent for reuse

PROJECT STATUS

Laboratory validation focused on the rheology and performance testing (corrosion tests and breakeven experiment) of the developed drilling fluid. Figure 2 shows the results of the breakeven experiments performed in a 50 ml Burette with fritted disk (40-60 μm) on three different working fluids (Base fluid that does not have H₂S scavenger, Base fluid with Triazine, and Base fluid with KFUPM H₂S scavenger additive) at room temperature.

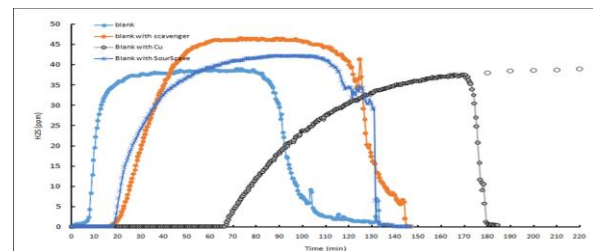


Fig. 2 Breakthrough curves for sorption of H₂S by different working fluids.

ABOUT KFUPM

King Fahd University of Petroleum & Minerals is a leading educational organization for science and technology.

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¹QYResearch- Global hydrogen-sulfide removal market research