

COMPOSITION AND METHOD FOR REMOVING OIL-BASED FILTER CAKE



THE INVENTION

This invention discloses a new formulation that can be applied either in single or multi-stage for treatment and removal of the barite filter cake formed on the formation face by the use of oil base mud during drilling operations.

MARKET NEED

Effective clean-up operations reduce the risk of formation damage and enhance well productivity by efficiently and meticulously planning out the removal of leftover drilling fluid residue and casing debris. Filter cake breakers are chemicals that can improve flow rates by "breaking" polymer gels and helping operators remove fluid cake residue and near-wellbore formation damage. Demand for Oilfield chemicals in the U.S. is forecast to increase 2.1 percent annually through 2017 to \$10.5 billion¹. Figure 1 indicates that the strong growth is driven by increasing drilling activity, production and the use of technologies such as hydraulic fracturing and enhanced oil recovery (EOR). New technologies have transformed the market for oilfield chemicals during the past decade. Leading players in the global Oilfield chemical market include; Solvay, Ecolab, Newpark, Halliburton, Schlumberger and Baker Hughes.

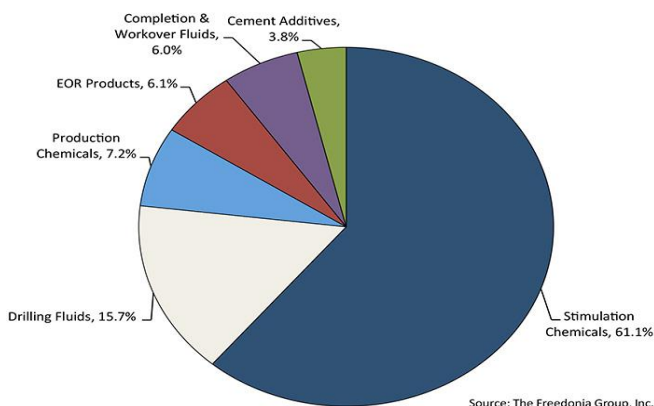


Fig .1 U.S. oilfield chemicals demand in 2017, up to \$10.5 billion

PATENT PROTECTION

A patent application covering composition and method of treatment/removal with application number US15/650341 and US16729858 were filed. IP is owned by King Fahd University of Petroleum & Minerals (KFUPM).

¹ <https://www.upstreampumping.com/article/upstream-market/dec-2013/us-oilfield-chemicals-demand-reach-113-billion-2017>

COMPETITIVE ADVANTAGE

- High removal efficiency of filter cake (80-85%).
- The corrosion rate of the developed formulation is very low (was 0.009 lbm/ft² at 350°F).
- Eliminates formation damage due to compatibility with the formation rocks.
- The single stage and multi-stage treatments can last for 24-hours and 48-hours removal

TECHNOLOGY READINESS

Laboratory efforts focused on the performance and characteristics of the developed formulation in dissolution of barite filter cake formed in oil base drilling fluids. Figure 2 shows Filter cake sample before and after removal process was applied at 300°F and 300 psi at 48-hour removal.

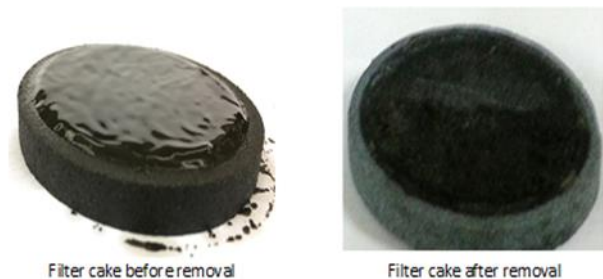


Fig. 2 Filter cake sample at 300°F and 300 psi after 24-hour removal

NEXT STEPS

KFUPM welcomes an ambitious industry partner to validate this technology at the field scale through licensing/commercialization of this invention.

ABOUT KFUPM

King Fahd University of Petroleum & Minerals is a leading educational organization for science and technology. KFUPM Innovation & Industrial Relations is the IP management and technology licensing office tasked with taking innovation from lab to market place.

For further information, please contact:
Email: IP-License@kfupm.edu.sa