

## NEWS FROM MALVERN INSTRUMENTS

### New research from Clausthal University highlights the value of Malvern's Kinexus for characterizing drilling fluids

**22nd December 2015: Malvern, UK:** Researchers at The Institute of Petroleum Engineering at TU Clausthal in Germany are being supported by Malvern Instruments in new work to understand and optimize the performance of Enhanced Oil Recovery (EOR) fluids. The polymeric solutions used for EOR exemplify the fluids used in a range of drilling applications to maximize oil extraction while at the same time safeguarding geological formations. Details of the work have recently been presented in a new webinar which is available for download/viewing at: <http://bit.ly/OilRheo>

EOR involves injecting a solution into the porous rock surrounding a well and can boost the amount of oil extracted by up to 20%. The fluids used are relatively concentrated solutions of high molecular weight polymers and have interesting flow behavior. The new research demonstrates the ability of the Kinexus rheometer from Malvern to measure the viscous (liquid-like) and elastic (solid-like) responses of EOR fluids in order to characterize and predict how they will perform under the conditions likely to be encountered during use.

The resulting data enable rationalization of the behavior of EOR fluids in porous media. In use these fluids must accelerate and decelerate as they traverse pores through narrow connecting channels. This generates stretching or extensional forces along the flow axis due to their viscoelastic characteristics, while at the same time fluid close to the walls is subjected to shear forces. Viscoelastic fluids demonstrating such behavior have been shown to improve displacement efficiency and recovery yields compared with conventional Newtonian fluids.

EOR fluids must therefore be formulated to exhibit optimum viscoelastic behavior and resistance to stretching, a feature that can be investigated directly by rheological characterization. Furthermore, the research shows how a range of complementary methods accessible via the Kinexus can be applied to gain valuable insight into the effect of concentration, temperature and brine reservoir hardness on fluid performance. The resulting data support the safe and effective use of these commercially valuable industrial fluids.

To find out more about Kinexus visit: <http://goo.gl/OCbxQP>

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Malvern provides the materials and biophysical characterization technology and expertise that enables scientists and engineers to understand and control the properties of dispersed systems. These systems range from proteins and polymers in solution, particle and nanoparticle suspensions and emulsions, through to sprays and aerosols, industrial bulk powders and high concentration slurries. Used at all stages of research, development and

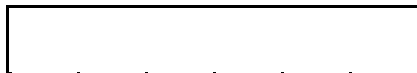
manufacturing, Malvern's materials characterization instruments provide critical information that helps accelerate research and product development, enhance and maintain product quality and optimize process efficiency.

Our products reflect Malvern's drive to exploit the latest technological innovations and our commitment to maximizing the potential of established techniques. They are used by both industry and academia, in sectors ranging from pharmaceuticals and biopharmaceuticals to bulk chemicals, cement, plastics and polymers, energy and the environment.

Malvern systems are used to measure particle size, particle shape, zeta potential, protein charge, molecular weight, mass, size and conformation, nanoparticle size and count, rheological properties and for chemical identification, advancing the understanding of dispersed systems across many different industries and applications.

Headquartered in Malvern, UK, Malvern Instruments has subsidiary organizations in all major European markets, North America, Mexico, China, Japan and Korea, a joint venture in India, a global distributor network and applications laboratories around the world.

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**USA contact:** Marisa Fraser, Malvern Instruments Inc.

117 Flanders Road, Westborough, MA 01581-1042

USA Tel: +1 508 768 6400 Fax: +1 508 768 6403 [marisa.fraser@malvern.com](mailto:marisa.fraser@malvern.com)

**Please send sales enquiries to:** Alison Vines, Malvern Instruments Ltd

Enigma Business Park, Grovewood Road, Malvern, Worcestershire WR14 1XZ UK

Tel: +44 (0) 1684 892456; Fax: +44 (0) 1684 892789 [salesinfo@malvern.com](mailto:salesinfo@malvern.com)

[www.malvern.com](http://www.malvern.com)

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