



Energy - Oil and Gas Research; Findings on Oil and Gas Research Reported by Investigators at University of Texas Austin (Water-oil Displacement In Shale: New Insights From a Comparative Study Integrating Imbibition Tests and Multiscale Imaging)

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2021 NOV 19 (VerticalNews) -- By a News Reporter-Staff News Editor at Energy Weekly News -- Investigators publish new report on Energy - Oil and Gas Research. According to news originating from Austin, Texas, by VerticalNews correspondents, research stated, "Water-oil displacement is an important process that occurs in a shale matrix after hydraulic fracturing and in water-based enhanced oil recovery. Current understanding of this displacement process is limited because of the complicated pore structure and surface properties in shale."

Financial supporters for this research include University of Texas at Austin Startup Fund for Sheng Peng, Project STARR (State of Texas Advanced Oil and Gas Resource Recovery), Mudrock Systems Research Laboratory of the **Bureau of Economic Geology** at University of Texas at Austin, Mudrock Systems Research Laboratory.

Our news journalists obtained a quote from the research from the University of Texas Austin, "In this work, this process and its controlling factors are investigated through a comparative study of three shale samples that have different types of pore systems and wettability. An integrated method of imbibition and multiscale imaging was applied, and a modified oleic tracer that can better represent oil flow was used in imbibition testing and micro-computed tomography (CT) imaging. Scanning electron microscope (SEM) pore characterization was then performed under high magnification with guidance from the micro-CT images showing the changes caused by oil or water imbibition. New insights were obtained on the importance of both wettability and pore size effect on oil recovery and the distribution of residual oil after water-oil displacement. Connectivity of pores with different wettability is also discussed based on 3D analysis and SEM pore characterization. Collectively, these new findings improve the understanding of the complicated process of water-oil displacement and the role of influencing factors. Important implications for improved oil recovery strategy in shale are discussed for different types of reservoir rocks."

According to the news editors, the research concluded: "The integrated imaging and imbibition technique provides a new path for further investigation of improved oil recovery in shale."

This research has been peer-reviewed.

For more information on this research see: Water-oil Displacement In Shale: New Insights From a Comparative Study Integrating Imbibition Tests and Multiscale Imaging. SPE Journal, 2021;26(5):3285-3299. SPE Journal can be contacted at: Soc Petroleum Eng, 222 Palisades Creek Dr, Richardson, TX 75080, USA.

The news correspondents report that additional information may be obtained from Sheng Peng, University of Texas Austin, Austin, TX 78712, United States. Additional authors for this research include Priyanka Periwal, Robert M. Reed and Pavel Shevchenko.

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