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Science - Natural Gas Science and Engineering; Researchers from University of Texas Austin Report New Studies and Findings in the Area of Natural Gas Science and Engineering (Gas-water Relative Permeability of Unconventional Reservoir Rocks: Hysteresis and Influence On Production After ...)

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2020 OCT 19 (VerticalNews) -- By a News Reporter-Staff News Editor at Journal of Engineering -- Current study results on Science - Natural Gas Science and Engineering have been published. According to news originating from Austin, Texas, by VerticalNews editors, the research stated, "Relative permeability is one of the most important parameters in reservoir modeling. However, measurements of relative permeability in unconventional reservoir rocks are rare, and the influence of relative permeability hysteresis on reservoir studies has not previously been addressed."

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

Our news journalists obtained a quote from the research from the University of Texas Austin, "This paper presents a systematic investigation of gas-water relative permeability and hysteresis based on a laboratory technique developed through our pre-vious work. Gas relative permeability was measured using the modified gas expansion method under the scenario of drainage and subsequent imbibition. Water relative permeability was estimated based on Brooks-Corey (1956) equations. Results of gas-water relative permeability that cover a broader range of saturation than that in our previous work were obtained. Causes of relative permeability hysteresis are discussed in detail. The laboratory -based gas-water relative permeability of one of the samples is compared to history-matched results from the literature, and upscaling of the laboratory result is discussed on the basis of this comparison. Finally, the po-tential influence of relative permeability hysteresis on water and gas production after hydraulic fracturing and shut-in is illustrated through a conceptual model and quantitative analysis. Gas production rates can be over-estimated after hydraulic fracturing when hysteresis is ignored. Shut-in can enhance gas production rates significantly. Enhancement of production rate is greater at the initial phase, but it diminishes later, after continuous expansion of the imbibition zone."

According to the news editors, the research concluded: "This work presents the first known study of gas-water relative permeability hysteresis in unconventional reservoir rocks."

This research has been peer-reviewed.

For more information on this research see: Gas-water Relative Permeability of Unconventional Reservoir Rocks: Hysteresis and Influence On Production After Shut-in. Journal of Natural Gas Science and Engineering, 2020;82():. Journal of Natural Gas Science and Engineering can be contacted at: Elsevier Sci Ltd, The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, Oxon, England. (Elsevier - www.elsevier.com; Journal of Natural Gas Science and Engineering - www.journals.elsevier.com/journal-of-natural-gas-science-and-engineering/)

The news correspondents report that additional information may be obtained from Sheng Peng, University of Texas Austin, Jackson School of Geosciences, Bur Econ Geol, Pob 10, Austin, TX 78713, United States.

Keywords for this news article include: Austin, Texas, United States, North and Central America, Natural Gas Science and Engineering, Science, University of Texas Austin.

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