Nanotechnology - Nanoporous; Researchers from University of Texas Austin Report Details of New Studies and Findings in the Area of Nanoporous (Advanced Understanding of Gas Flow and the Klinkenberg Effect In Nanoporous Rocks)

527 words
1 November 2021
Nanotechnology Weekly
NANOWK
2099
English

2021 NOV 1 (VerticalNews) -- By a News Reporter-Staff News Editor at Nanotechnology Weekly -- New research on Nanotechnology - Nanoporous is the subject of a report. According to news originating from Austin, Texas, by VerticalNews editors, the research stated, "Gas flow in nanoporous rocks is closely relevant to several globally important energy and environmental issues, such as shale-gas production and CO2 subsurface sequestration. The Klinkenberg effect is critical to an understanding of gas flow, yet many specifics are unclear for nanoporous rocks."

Financial supporters for this research include The 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, MSRL.

Our news journalists obtained a quote from the research from the University of Texas Austin, "Here we investigated gas flow and the Klinkenberg effect in nanoporous rocks on the basis of a systematic study of gas permeability and diffusivity under a range of pore pressures and varying water saturations. We invalidated the use of the Klinkenberg equation for determination of intrinsic permeability and the Klinkenberg slippage factor on the basis of measurements in current laboratory conditions and propose a modified Klinkenberg equation for a more reliable determination of the slippage factor. We show that gas relative permeability is higher at higher pore pressures and that the Klinkenberg effect is more important in lower water saturations than in higher ones. The underlying mechanism of increased pore size after saturation was elucidated through neutron imaging on water distribution. In addition, we demonstrate that gas diffusivity better characterizes the diffusive gas flow than gas permeability and can be higher at higher pressures in either dry or partly saturated conditions. Finally, a characteristic porediameter index was derived on the basis of a new form of porosity-permeability relationship and was found to have a good correlation, which was previously lacking, with the Klinkenberg slippage factor for nanoporous rocks."

According to the news editors, the research concluded: "Collectively, these new insights can advance the understanding of gas flow in nanoporous rocks and will have important implications on industrial applications."

This research has been peer-reviewed.

For more information on this research see: Advanced Understanding of Gas Flow and the Klinkenberg Effect In Nanoporous Rocks. Journal of Petroleum Science and Engineering, 2021;206. Journal of Petroleum Science and Engineering can be contacted at: Elsevier, Radarweg 29, 1043 Nx Amsterdam, Netherlands. (Elsevier - www.elsevier.com; Journal of Petroleum Science and Engineering - www.journals.elsevier.com/journal-of-petroleum-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, Univ Stn, Box 10, Austin, TX 78713, United States.

Keywords for this news article include: Austin, Texas, United States, North and Central America, Emerging Technologies, Nanoporous, Nanotechnology, University of Texas Austin.

Document NANOWK0020211101ehb1001be