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Engineering - Chemical Engineering; Studies in the Area of Chemical Engineering Reported from China University of Petroleum (East China) (Molecular Insights Into Carbon Dioxide Enhanced Multi-component Shale Gas Recovery and Its Sequestration In Realistic Kerogen)

571 words
3 December 2021
Chemicals & Chemistry
CHEMEC
4991
English

2021 DEC 10 (VerticalNews) -- By a News Reporter-Staff News Editor at Chemicals & Chemistry -- Fresh data on Engineering - Chemical Engineering are presented in a new report. According to news reporting from Qingdao, People's Republic of China, by VerticalNews journalists, research stated, "Understanding the governing processes of CO2 huff-n-puff in shales is essential for enhancing shale gas recovery and CO2 sequestration. However, existing studies have not fully accounted for the chemical composition and geometry of kerogen nanopores and the reality that natural gas is a multi-component mixture."

Funders for this research include National Natural Science Foundation of China (NSFC), Applied Fundamental Research Project of Qingdao, Mudrock Systems Research Laboratory at the **Bureau of Economic Geology**, Jackson School of Geosciences, The University of Texas at Austin, NanoGeosciences Lab at the **Bureau of Economic Geology**, Jackson School of Geosciences, The University of Texas at Austin.

The news correspondents obtained a quote from the research from the China University of Petroleum (East China), "We used grand canonical Monte Carlo (GCMC) simulations to study the competitive adsorption between CO2 and typical hydrocarbon components (CH4, C2H6, and C3H8). We further studied the recovery mechanisms of CO2 huff -n-puff within kerogenic circular nanopores at reservoir conditions. We probed the effects of pressure, pore geometry, and size on gas recovery and CO2 sequestration efficiency. Although pressure drop readily exploits CH4 in the adsorption layer, the recovery due to CO2 injection primarily occurs within the kerogen matrix for pure CH4. Injecting CO2 facilitates the recovery of heavier hydrocarbons, whereas pressure drawdown exhibits better performance for lighter components. CO2 huff -n-puff may serve as a promising method for gas exploitation in circular pores, whereas pressure drop favors the production in kerogen slit. The tremendously different gas adsorption and recovery behavior in distinct pore geometries and compositions necessitate the study using realistic shale kerogen models. Moreover, enlarging the pore size improves the recovery of each component during pressure drawdown but restrains the performance of CO2 injection; meanwhile, the total gas recovery and CO2 sequestration efficiency increase."

According to the news reporters, the research concluded: "This study provides a more in-depth understanding of multi-component gas recovery mechanisms within realistic shale kerogen nanopores and sheds light on the CO2 sequestration in shale reservoirs."

This research has been peer-reviewed.

For more information on this research see: Molecular Insights Into Carbon Dioxide Enhanced Multi-component Shale Gas Recovery and Its Sequestration In Realistic Kerogen. Chemical Engineering Journal, 2021;425. Chemical Engineering Journal can be contacted at: Elsevier Science Sa, PO Box 564, 1001 Lausanne, Switzerland. (Elsevier - www.elsevier.com; Chemical Engineering Journal - www.journals.elsevier.com/chemical-engineering-journal/)

Our news journalists report that additional information may be obtained by contacting Sen Wang, China University of Petroleum (East China), School of Petroleum Engineering, Qingdao 266580, People's Republic of China.

Additional authors for this research include Xinyu Yao, Qihong Feng, Yuxuan Yang, Farzam Javadpour, Qingzhong Xue and Xiaofang Li.

Keywords for this news article include: Qingdao, People's Republic of China, Asia, Chemical Engineering, Engineering, Carbon Dioxide, Chemicals, China University of Petroleum (East China).

Document CHEMEC0020211203ehc3002ne

