
Chemicals and Chemistry; Studies from University of Texas in the Area of Chemicals and Chemistry Described (Controls of Geological Factors On H2 Adsorption In the Subsurface)

474 words

23 September 2025

Life Science Weekly

LFSW

4991

English

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2025 SEP 23 (NewsRx) -- By a News Reporter-Staff News Editor at Life Science Weekly -- Investigators discuss new findings in Chemicals and Chemistry. According to news originating from Austin, Texas, by NewsRx correspondents, research stated, "Underground hydrogen storage has been regarded as a sustainable and reliable way to maintain a stable national-scale energy supply in the development of the hydrogen economy. Various risks influencing subsurface H2 recovery due to interactions between H2, water, and rocks remain to be evaluated thoroughly."

Financial supporters for this research include **Bureau of Economic Geology's** GeoH2 industrial affiliates program, University of Texas at Austin, **Bureau of Economic Geology**.

Our news journalists obtained a quote from the research from the University of Texas, "In this study, the effects of geological factors on H2 sorption are discussed among the organic-matter-rich and lean samples. The measurements of H2 and CH4 adsorption on coals with different maturities and smectite, which has large pore surface areas but no organic oxygen-functional groups, were made at temperatures from 35 to 65 degrees C and pressures up to 15 MPa. The adsorbed amounts of H2 and CH4 in coal samples were much higher than those in smectite at different temperatures, as verified by Langmuir monolayer modeling. Our study indicates that the BET surface area of the sample material is an important factor influencing H2 sorption, providing the sorption sites on the rock surface, but this will greatly be influenced by the chemical structures due to the interaction of H2 with organic oxygen-containing functional groups. This is verified by a comparison of H2 sorption between coals and smectite. For the hydrogen geological storage, we find that at least 30% more H2 can be stored in the coal seam due to mainly physical sorption, compared with the H2 amounts in the free phase at the same geological condition."

According to the news editors, the research concluded: "Our study deepens our understanding of the controlling effect of geological factors on H2 storage in the subsurface."

For more information on this research see: Controls of Geological Factors On H2 Adsorption In the Subsurface. ACS Omega, 2025. ACS Omega can be contacted at: Amer Chemical Soc, 1155 16TH St, NW, Washington, DC 20036, USA.

The news correspondents report that additional information may be obtained from Tongwei Zhang, University of Texas, Bur Econ Geol, Austin, TX 78713, United States. Additional authors for this research include Xiaoqiang Li, Clifford C. Walters and Xun Sun.

Keywords for this news article include: Austin, Texas, United States, North and Central America, Chemicals and Chemistry, University of Texas.

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Document LFSW000020250923e19n003j2