

Abstract Submitted
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Combination Gravimetric/Volumetric Sorption Instrument for Energy Applications. DONALD BETHEA, JACOB BURRESS, Univ of South Alabama — The use of gaseous fuels such as hydrogen and methane (natural gas) will reduce emissions. Unfortunately, the storage of hydrogen and methane at room temperature is difficult because they are both supercritical gases, making the adoption of these fuels cumbersome. One means of overcoming the storage problem is to use physisorption-based systems which exploit the van der Waals interaction between the gas and a nanoporous material to compress the gases to near liquid densities. To measure the amount of gas in these materials, gravimetric or volumetric methods are employed. Gravimetric weighs the amount of gas and volumetric uses differences in gas pressures. Gravimetric systems typically have problems with buoyancy corrections. Volumetric systems normally have larger uncertainties that propagate through the isotherm. A modified system will be presented which allows for both gravimetric and volumetric gas sorption measurements. Additionally, the buoyancy corrections for the gravimetric measurements are significantly small and less than the uncertainties in the measurement. This apparatus can take measurements of most gases at room temperature and up to 200 bar.

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