

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Gettering of Hydrogen and Methane from a Helium Gas Mixture

ROSA E. CARDENAS, Department of Physics, The University of the Incarnate Word, 4301 Broadway, San Antonio, TX 78209, DONALD F. COWGILL, KENNETH D. STEWART, Sandia National Laboratories, Hydrogen and Metallurgical Sciences, 7011 East Avenue, Livermore, CA 94550 — In this study, we developed an approach for accurately quantifying the helium content in a gas mixture also containing hydrogen and methane using commercially available getters. We performed a systematic study to examine how both H₂ and CH₄ can be removed simultaneously from the mixture using two SAES St 172[®] getters operating at different temperatures. The remaining He within the gas mixture can then be measured directly using a capacitance manometer. The optimum combination involved operating one getter at 650°C to decompose the methane, and the second at 110°C to remove the hydrogen. This approach eliminated the need to reactivate the getters between measurements, thereby enabling multiple measurements to be made within a short time interval, with accuracy better than 1%. We anticipate that such an approach will be particularly useful for quantifying the He-3 in mixtures that include tritium, tritiated methane, and helium-3. The presence of tritiated methane, generated by tritium activity, often complicates such measurements.

Rosa Cardenas
The University of the Incarnate Word

Date submitted: 30 Oct 2014

Electronic form version 1.4