87g High-Accuracy Density Measurements for a Natural Gas Mixture

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High-accuracy density measurement data are necessary to validate equations of state (EOS) for use in custody transfer of natural gas. The AGA8-DC92 EOS, currently the industry standard, has been validated against a databank of gas mixtures with compositions containing up to 0.2 mole percent of the C6+ fraction and should predict densities of natural gas mixtures containing higher mole percentages of the C6+ fraction with the same accuracy. Production of natural gas streams containing higher percentages of the C6+ fraction has begun in the deepwater and ultra-deepwater Gulf of Mexico. High-accuracy, density data for such natural gas mixtures are required to check the ability of AGA8-DC92 to cover the entire range of pressure, temperature and compositions encountered in custody transfer. A state-of-the-art, high pressure, high temperature, compact single-sinker magnetic suspension densitometer has been used to collect densities of a simulated natural gas mixture after validating its operation by measuring densities of pure argon, nitrogen and methane in the range (270 to 340) K [(26.33 to152.33) oF, (-3.15 to 66.85) oC] and (3.447 to 34.474) MPa [(500 to 5,000) psia]. The measured data can be used to recalibrate the parameters of the AGA8-DC92 EOS or to validate an entirely new EOS.