Carbon Content, Sampling, and Calculation

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Introduction

Carbon emission quantities can be calculated from either the volume/mass of fuel or feedstock fed to a process (as applicable) and carbon content of the process or fuel supply, or by directly measuring volume/mass emissions.

This Technical Report (TR) provides guidance on the sampling and calculation of carbon content of process or fuel supplies. The API companion technical report, API TR 2571, *Fuel Gas Measurement*, can be referenced for guidance on measuring the volume/mass of process fuel gas or feedstock, and the API *Compendium of Greenhouse Gas Emissions Estimation Methodologies for the Oil and Natural Gas Industry* can be reference for guidance on the calculation of emissions.

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1 Scope

This Technical Report (TR) provides guidance and a methodology for determination of carbon content from hydrocarbon-based petroleum and petrochemical products, and the uncertainty of the average carbon content as calculated from multiple samples taken during a reporting period. This method is intended to make use of industry-accepted mixture property data and test methods with no new or modified test methods introduced in this document. The method is applicable to carbon-content-based reporting or trading for all gaseous and liquid hydrocarbons.

This TR provides references and supplemental information on applicable industry practices based on the published resources, existing industry standards, industry-accepted physical constants or properties of hydrocarbons for measurement, sampling, sampling frequency, and analysis of hydrocarbon samples.

2 Terms, Definitions, and Symbols

2.1 Terms and Definitions

For the purposes of this document, the following definitions apply.

2.1.1
accuracy
The ability of a measurement instrument to indicate values closely approximating the true value of the quantity measured.

2.1.2
bias
Any influence on a result that produces an incorrect approximation of the true value of the variable being measured. Bias is the result of a predictable systematic error.

2.1.3
calibration
The process or procedure of adjusting an instrument so that its indication or registration is in satisfactorily close agreement with a reference standard.

2.1.4
carbon content
The fraction of carbon in the fluid expressed as percent by weight.

2.1.5
compensation
The adjustment of the measured value to reference conditions (e.g. pressure compensation).

2.1.6
continuous emission monitoring system
CEMS
The equipment required to sample, analyze, measure, and provide, by means of monitoring at regular intervals, a record of gas concentrations, pollutant emission rates, or gas volumetric flow rates, individually or in combination, from stationary sources.

2.1.7
flowing compressibility
The compressibility of the fluid at actual flowing temperature and pressure.