Analysis of Natural Gas Liquids by Gas Chromatography

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ACRONYMS

API – American Petroleum Institute

ASTM – American Society for Testing and Materials

GC – Gas Chromatography

ISO – International Organization for Standardization

NGL – Natural Gas Liquid

PPMW – Parts per million by mass

TCD – Thermal Conductivity Detector

DEFINITIONS

Absolute Response Factor - The ratio between the concentration of a component in a sample and the detectors response (peak area) to that component.

Baseline - The portion of the chromatogram that represents any time period during which only the mobile/inert phase is passing through the detector.

Gasoline - The portion derived from natural gas liquids that is generally referred to as natural gasoline and not an actual refined product.

Normalize - Multiply by a factor that makes the sum of the associated quantities equal to a desired value (usually 100 for chromatography).

Precut Column - A partition column of an appropriate length to clearly separate the heavier hexanes plus fraction from the lighter components.

Relative Response Factor - The ratio between the absolute response factor of a component and the absolute response factor of a specified component.

Repeatability - As referred to in this standard, it is the expected precision within a laboratory using the same instrument and the same analyst while using the same sample in the same sample cylinder. Repeatability is evaluated using the difference in analyzed values between two sequential runs. See also ASTM D6300.

Reproducibility - The expected precision for a test result when a different instrument and/or different analyst analyzing the same material from the same sample cylinder. See also ASTM D6300.

REFERENCES

ASTM D6300-08 - Standard Practice for Determination of Precision and Bias Data for Use in Test Methods for Petroleum Products and Lubricants

ASTM D7423 - Standard Test Method for Determination of Oxygenates in C2, C3, C4, and C5 Hydrocarbon Matrices by Gas Chromatography and Flame Ionization Detection

GPA 2103 - Tentative Method for the Analysis of Natural Gas Condensate Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography

GPA 2145 - Table of Physical Properties for Hydrocarbons and Other Compounds of Interest to the Natural Gas and Natural Gas Liquids Industries

GPA 2166 - Obtaining Natural Gas Samples for Analysis by Gas Chromatography

GPA 2172 - Calculations of Gross Heating Value, Relative Density, Compressibility and Theoretical Hydrocarbon Liquid Content for Natural Gas Mixtures for Custody Transfer

GPA 2174 - Obtaining Liquid Hydrocarbons Samples for Analysis by Gas Chromatography

GPA 2177 - Analysis of Natural Gas Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Gas Chromatography

GPA 2186 - Method for the Extended Analysis of Hydrocarbon Liquid Mixtures Containing Nitrogen and Carbon Dioxide by Temperature Programmed Gas Chromatography

GPA 2198 - Selection, Preparation, Validation, Care and Storage of Natural Gas and Natural Gas Liquids Reference Standard Blends

GPA 2261 - Analysis for Natural Gas and Similar Gaseous Mixtures by Gas Chromatography

GPA RR-188 - GPA Round Robin Chromatograph Test Project

GPA TP-31 - GPA 2261 and GPA 2177 Methods Precision Statements Calculation

ISO 5725-2:94 - Accuracy (trueness and precision) of measurement methods and results – Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method