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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 22634-2008

**Conversion between water content and water dew point of
natural gas**

天然气水含量与水露点之间的换算

(English Translation)

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Foreword

This revised standard adopts ISO 18453 "associated gas --- water content and water dew point between" (2004, in English), also refer to ASTM D1142 "Standard Test Method obtained by measuring the dew point of water vapor content" (1995 in English) and IGT Research Report 8 "Days Natural gas equilibrium water content "(1995, in English) from the text.

This standard is based on ISO 18453:2004 redrafted.

Taking into account the special needs of our regulatory requirements and industry standards at the time of the adoption of international standards has been modified. For ease of use, this standard Associate in editorial, technical, text structure has been modified. About the technical differences have been incorporated into the text and in terms of which they are involved Margin identified by a single vertical line. We give a list of these technical differences and their causes in Appendix F for reference.

This standard and ISO 18453:2004 The main differences are as follows.

--- Writing rules according to GB/T 1.1-2000 "Standardization Guide Part 1. Structure and standard writing rules" Writing;

- Chapter 1 Scope, based on ISO 18453, Chapter 1, the increase in the standard reference conditions specified;
- Chapter 2 symbols and definitions, symbols are the ISO 18453:2004 Appendix D subscript, symbols and units of content to this chapter, and According to GB/T 1.1-2000 make the necessary changes, using the definition of ISO 18453:2004 Content Chapter 2, delete the "normal parameter Than conditions "and" traceability "is defined;
- Appendix D, the contents of the ISO 18453 Appendix D Symbols and Definitions moved to Chapter 2, remove the rest of the abbreviated content, and Unit conversion for relevant content to improve and refine;
- Appendix E, Reference ASTM D1142. 6.3 and IGT in 1995 research report prepared by the content of 8;
- Some of the statements apply to international standards to apply to our standard formulation;
- Delete ISO 18453:2004 Foreword by modifying the ISO 18453:2004 introduction.

Appendix C of this standard is a normative appendix, Appendix A, Appendix B, Appendix D, Appendix E, Appendix F are informative appendices.

This standard by the National Standardization Technical Committee proposed natural gas.

This standard by the National Standardization Technical Committee on Gas (SAC/TC244) centralized.

This standard drafting units. China Southwest Oil & Gas Field Branch, Research Institute of Petroleum, China Petroleum Engineering Co., Ltd.

Southwest Company.

Participated in the drafting of this standard. US special company Ami Process and Analytical Products.

Introduction

ISO 18453:2004 standard provides a reliable mathematical relationship of natural gas in the water content and water dew point between. The Calculation Method GERG1 law is developed for the water content of the water dew point calculation or. Information related with thermodynamic principles given in Appendix C; and its traceability Information relating to the application and uncertainty are given in Appendix B.

Gas Industry some operational problems can be traced to natural gas water content. Even low levels of water vapor in natural gas, Operating conditions of pressure and temperature changes may also cause the hydraulic analysis, leading to corrosion problems the formation of hydrates or ice. To avoid these Problem, gas companies have to install

expensive dewatering device. Design and cost of these devices depend on the exact content of the water dew point and understanding (contract) under the water content.

Over the past few decades, due to improved moisture measuring instruments which led to the development of the instrument measured water content focused on, rather than focus on water dew point. Therefore, if the measurement of water content, it needs water dew expression correlations.

GERG recognized before confirming the conventional correlation between water content and water dew point, we need a large number of representative within the attention range the water content and water dew point of natural gas corresponding to establish a comprehensive and accurate database.

It proved that the uncertainty range of the existing correlation can be improved.

Therefore, a more accurate correlation depends on the composition of successfully developed on the basis of this new database on.

ISO 18453:2004 standard is developed by the GERG with representative of the custody transfer of natural gas in the water content and water dew Relations between points (or vice versa) the calculation process standardization.

In order to make the standard more practical, realistic China's natural gas industry, reference ASTM D1142. 6.3 in 1995, and IGT RESEARCH Study report content 8 (1995), an increase of Appendix E "under Bukacek equilibrium gas water content correlation."

1 GERG is "European Gas Research Organization Groupe Européen de Recherche Gazière" acronym.

In terms of the water content and water dew point of natural gas between

1 Scope

This standard establishes when the water content of the natural gas or water dew point which is known between a reliable mathematical relationship; and Given the correlation of uncertainty, but uncertainty of measurement without quantization rules.

Calculation of this standard, both for calculating water content, but also for water dew point calculation.

Unless otherwise specified, the standard volume used in this standard reference conditions. pressure 101.325 kPa, a temperature of 20 °C.

2.1 Symbols and units

Symbols and units used in this standard are shown in Table 1.

Table 1 Symbols and units

Dimensionless unit Symbol Meaning Symbol Chou volume compensation parameter $L^3 m^{-1} m^3 / kmol$ $X(y)$ the mole fraction of 1 R the gas constant (0.008314510) $ML^2 T^{-2} m^{-1} \theta^{-1}$ $MJ / kmol K$ T thermodynamic (absolute) temperature θ K V_p volume $L^3 m^3$ V_p m molar volume $L^3 m^{-1} m^3 / kmol$ the water content β concentration represented by $ML^{-3} mg / m^3$ ω eccentric factor and related substances 1 K and material related to constant 1
Subscript c indicates a critical point Subscript R represents Comparative Condition
Subscript v indicates Gas Subscript w represents water Note. In the "Dimension" column, length, mass, time, Moore and dimensionless thermodynamic temperature, respectively L , M , T , m and θ represent.

2.2 Terms and Definitions

The following terms and definitions apply to this standard.

2.2.1

Relationship distributed random variables in two or more random variables between two or more.