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

GB/T 47872.3-2026

**Petroleum and natural gas industries - Completion fluids and
materials - Part 3: Testing of heavy brines**

石油天然气工业 完井液和材料 第3部分：重盐水的测试

(English Translation)

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is Part 3 of GB/T 47872 "Completion Fluids and Materials for the Petroleum and Gas Industry". GB/T 47872 has been published.

The following parts were included.

---Part 3: Testing of heavy salt water.

This document is modified to adopt ISO 13503-3:2022 "Petroleum and gas industry completion fluids and materials - Part 3: Determination of heavy brine".

try".

This document differs significantly from ISO 13503-3:2022. The relevant clauses are indicated in vertical margins.

Straight lines (|) are marked. A summary of these technical differences and their reasons can be found in Appendix A.

The following editorial changes have been made to this document.

---The note for the term "crystallization temperature" has been deleted (see Chapter 3);

---Added Appendix A (informative) "Technical differences between this document and ISO 13503-3:2022 and the reasons thereof".

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed and is under the jurisdiction of the National Technical Committee on Standardization of Petroleum and Natural Gas (SAC/TC355).

Introduction

The purpose of drilling, completion, workover, and fracturing operations in the oil and gas industry is to establish channels for the flow of oil and gas in reservoirs.

Drilling and completion fluids, workover fluids, fracturing fluids, and other wellbore working fluids used in various stages of drilling and completion operations are essential fluids during the operation.

Performance testing of wellbore working fluids and their materials is crucial for ensuring the quality of corresponding wellbore industrial fluids. GB/T 47872 "Petroleum and Natural Gases" "Completion Fluids and Materials for the Natural Gas Industry" is a standard document that provides corresponding performance testing procedures and is planned to consist of six parts.

---Part 1: Testing of Completion Fluid Viscosity. The purpose is to provide a method for measuring the viscosity characteristics and rheological properties of single-phase, particle-free completion fluids.

Performance testing program.

---Part 2: Testing of proppant performance for hydraulic fracturing and gravel packing operations. The objective is to provide proppant performance for hydraulic fracturing and/or gravel packing operations.

Test procedure for the physical properties of the proppant used in the filling.

---Part 3: Testing of Heavy Brine. The purpose is to provide physical characteristics of heavy brine used in oil and gas well drilling fluids, completion fluids, and workover fluids.

Performance and testing methods.

---Part 4: Testing of Static Fluid Loss. The purpose is to provide a method for measuring fluid loss under static conditions.

---Part 5: Testing of Long-Term Proppant Conductivity. The aim is to provide a method for evaluating various hydraulic fracturing proppants under laboratory conditions.

Methods for determining the conductivity characteristics of agent materials.

This document describes the physical properties and testing methods of heavy brine for oil and gas well drilling fluids, completion fluids, and workover fluids, with a focus on providing methods for testing...

A more suitable method for determining the properties of formate brine, such as carbonate and bicarbonate concentrations, crystallization temperature under ambient pressure, and pH value.

Oil and gas industry completion fluids and materials Part 3: Testing of Heavy Salt Water

1 Scope

This document describes the physical properties and testing methods of heavy brine for use in oil and gas well drilling fluids, completion fluids, and workover fluids.

This document applies to the physical property testing of heavy brine used in oil and gas well drilling fluids, completion fluids, and workover fluids.

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

SY/T 0026.1 Determination of corrosion rate of metallic materials in oil and gas field media - Part 1: Corrosion plate method SY/T 6395 Test Procedure for Heavy Salt Water SY/T 6571 Performance Evaluation Method for Iron Ion Stabilizers for Acidification

3 Terms and Definitions

The following terms and definitions apply to this document.

The temperature at which crystals and liquids are in a stable equilibrium state.

4 Testing of heavy salt water

The physical property tests for heavy brine used in oil and gas well drilling fluids, completion fluids, and workover fluids described in this document include, but are not limited to, density, clarity, etc.

Tests were conducted on properties such as suspended solids content, iron content, buffering capacity (concentration of carbonates and bicarbonates), crystallization temperature, and pH value.

The requirements specified in API RP 13J.2023 apply to cases other than those specified in sections 4.2 to 4.5. The carbonates and carbons specified in sections 4.2 to 4.5...

The test methods for properties such as concentration, crystallization temperature, and pH value of formate salts are applicable to formate brine. Formate brine contains carbonates and bicarbonates.

Physical property testing beyond salt concentration, crystallization temperature, pH value, iron content, etc., and physical property testing of other brine solutions such as halides.

The relevant methods of API RP 13J.2023 and SY/T 6395 should be adopted. The corrosion performance testing of heavy brine should be conducted according to SY/T 0026.1.

method.

4.2 Methods for determining iron content

The method for determining iron content specified in Chapter 11 of API RP 13J.2023 shall not be applied to formate saline solutions. Formate saline solutions contain iron ions.

The content test should be performed using the method of SY/T 6571.