Technical Report

ISO/TR 17910

First edition
2024-01

Natural gas — Coal-based synthetic natural gas quality designation and the applicability of ISO/TC 193 standards

Gaz naturel — Désignation de la qualité du gaz naturel synthétique à base de charbon et applicabilité des normes de l'ISO/TC 193

Reference number
ISO/TR 17910:2024(en)

© ISO 2024



COPYRIGHT PROTECTED DOCUMENT

© ISO 2024
All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword ..... **iv**
Introduction ..... **v**
1 Scope **1**
2 Normative references **1**
3 Terms and definitions **1**
4 Symbols and units **4**
5 Brief introduction to CBSNG **4**
5.1 The production progress of CBSNG 4
5.2 The distribution of CBSNG 5
5.3 Components and composition range of typical CBSNG 6
6 Applicability of sampling standard **6**
7 Applicability of test and calculation standard **7**
7.1 General 7
7.2 Gas composition 7
7.2.1 General 7
7.2.2 Major components 7
7.2.3 Minor components 9
7.2.4 Trace constituents 11
7.3 Gas properties 12
7.3.1 General 12
7.3.2 Physical properties 12
7.4 Solid particulate matter 14
Annex A (informative) **Technical requirements and test methods for CBSNG** **15**
Annex B (informative) **Test methods for hydrogen** **16**
Annex C (informative) **Test methods for ammonia** **17**
Annex D (informative) **Applicability of interchangeability** **18**
Bibliography **21**

© ISO 2024 – All rights reserved

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 193, *Natural gas*, Subcommittee SC 1, *Analysis of natural gas*.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO 2024 – All rights reserved

Introduction

Coal-based synthetic natural gas (CBSNG) is a natural gas substitute. It refers to a natural gas-like mixture that is synthesized from coal. After gasification or coking, the coal releases gas that mainly contains CO, CO_2 and H_2. Then after the gas cleaning, the water gas shift and methanation process consecutively, the final product is coal based synthetic natural gas.

During the production process, the sulphur, CO_2, particle and NO_x emission can be controlled to a very low level compared to the direct utilization of coal. So the CBSNG can be considered as a clean energy resource.

At present, the production of CBSNG is mainly in the United States and China. There are plans of CBSNG projects also in South Korea, Ukraine, and Brazil.

Typical CBSNG contains more than 90 % methane and up to 5 % hydrogen, as well as a small portion of nitrogen and carbon dioxide, minor ethane, propane and traces of ammonia. This document aims to promote communication and coordination among countries, and to support the smooth progress of natural gas substitute development, production and custody transfer.

© ISO 2024 – All rights reserved

Natural gas — Coal-based synthetic natural gas quality designation and the applicability of ISO/TC 193 standards

1 Scope

This document introduces the production process, the distribution and quality designation of coal-based synthetic natural gas (CBSNG) in many places around the world, and examines whether ISO/TC 193 standards for sampling, test and calculation methods are applicable to the CBSNG product.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 14532, *Natural gas — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 14532 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
natural gas
NG
complex gaseous mixture of hydrocarbons, primarily methane, but generally includes ethane, propane and higher hydrocarbons, and some non-combustible gases such as nitrogen and carbon dioxide

Note 1 to entry: Natural gas can also contain components or containments such as sulfur compounds and/or other chemical species.

[SOURCE: ISO 14532:2014, 2.1.1.1]

3.2
indirect sampling
sampling in situations where there is no direct connection between the natural gas to be sampled and the analytical unit

[SOURCE: ISO 14532:2014, 2.3.1.2]

3.3
representative sample
sample having the same composition as the natural gas sample when the latter is considered as a homogeneous whole

[SOURCE: ISO 14532:2014, 2.3.4.2]

© ISO 2024 – All rights reserved