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

GB/T 3671.1-2025

Replacing GB/T 3671.1-1996

**Determination of application solubility and solution stability of
water-soluble dyes**

水溶性染料溶解度和溶液稳定性的测定

(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 1 of GB/T 3671, which has the following parts.

- GB/T 3671.1 Determination of solubility and solution stability of water-soluble dyes;
- GB/T 3671.2 Determination of cold water solubility of water-soluble dyes.

This document supersedes GB/T 3671.1-1996 "Determination of Solubility and Solution Stability of Water-Soluble Dyes", and is consistent with GB/T 3671.1-Compared to 1996, aside from structural adjustments and editorial changes, the main technical changes are as follows.

- a) Added terms and definitions (see Chapter 3);
- b) The requirements for conical flasks have been changed (see 5.1, 4.1 of the 1996 edition);
- c) The filter paper content has been changed (see 5.8, 4.8 in the 1996 edition);
- d) The procedure for determining solubility at 90°C has been modified (see 6.2, 5.2 of the 1996 edition);
- e) The vacuum level adjustment settings have been changed (see 7.4, 6.3 of the 1996 edition);
- f) The vacuum level information in the filtration operation has been removed (see 6.5 in the 1996 edition).

This document is modified to adopt ISO 105-Z07.1995 "Textiles - Tests for color fastness - Z07 part. Water-soluble dyes - Application of solubility and heat treatment properties".

Determination of liquid stability.

Compared with ISO 105-Z07.1995, this document has undergone many structural adjustments. A comparison of the structural numbering changes between the two documents is provided below.

See Appendix A for the table.

This document differs significantly from ISO 105-Z07.1995. The relevant clauses are indicated in vertical margins.

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

The following editorial changes have been made to this document.

---To align with existing standards, the standard name has been changed to "Determination of Solubility and Solution Stability of Water-Soluble Dyes".

---Note 2 of ISO 105-Z07.1995 has been deleted.

---Corrected a citation error in section 6.4 of ISO 105-Z07.1995.

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 by the China Petroleum and Chemical Industry Federation.

This document is under the jurisdiction of the National Technical Committee on Standardization of Dyes (SAC/TC134).

Introduction

Water-soluble dyes are classified according to their application performance into direct dyes, acid dyes, cationic dyes, reactive dyes, condensation dyes, and reactive fluorescent dyes.

The solubility of dyes and other substances in water is closely related to their application performance; solubility is one of the important technical indicators for water-soluble dyes. GB/T 3671 the invention aims to provide a basis for determining the solubility of water-soluble dyes and is proposed to consist of two parts.

---GB/T 3671.1 Determination of solubility and solution stability of water-soluble dyes;

---GB/T 3671.2 Determination of cold water solubility of water-soluble dyes.

Determination of solubility and solution stability of water-soluble dyes

1 Scope

This document describes a method for determining the solubility and solution stability of water-soluble dyes in the range of 40°C to 90°C.

This document applies to the determination of solubility and solution stability of water-soluble dyes. It is not applicable to the determination of absolute solubility.

Note: Appendix C lists several factors that may affect the test results.

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.

GB/T 1914 Chemical Analysis Filter Paper GB/T 6682-2008 Specifications and test methods for water used in analytical laboratories (ISO 3696:1987, MOD) Note. There are no technical differences between the content referenced in GB/T 6682-2008 and the content referenced in ISO 3696:1987.

GB/T 22362-2023 Laboratory glassware - Flasks (ISO 1773:1997, MOD) Note. The content referenced in GB/T 22362-2023 is not technically different from the content referenced in ISO 1773:1997.

3 Terms and Definitions

The following terms and definitions apply to this document.

solubility

The limit concentration at which a dye can completely dissolve in water at a certain temperature.

Note: The unit is grams per liter (g/L).

Solution stability

The property of a dye solution that, when stored under specific conditions for a certain period of time, does not undergo any physical or chemical changes.

4 Principles

Prepare a set of test dye solutions of known concentrations, including the solubility limit, at a specified temperature, and then sample them at that temperature.

The solution was filtered through a heated Buchner funnel using filter paper, and the solubility was determined by visually inspecting the residue on the filter paper and measuring the filtration time.

The limit.

The solubility of dyes is generally determined at 90°C. For some types of dyes, the determination is performed at a lower temperature, usually following the manufacturer's recommendations.

Select the test temperature. The temperature will be indicated in the test report (e.g., solubility at 90°C or solubility at 60°C, etc.).

The solution stability of the dye was determined by storing the solution for 2 hours, cooling it before filtration as needed, and then evaluating the solution, including the dissolution temperature.

The storage temperature is indicated in the test report (e.g., solution stability at 90°C/60°C or solution stability at 60°C/60°C, etc.).