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# GB/T 31531-2025

Replacing GB/T 31531-2015

# Determination of quinoline and isoquinoline in dyestuffs and textile dyeing and finishing auxiliaries

染料及纺织染整助剂产品中喹啉及异喹啉的测定

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# Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020 "Directives for standardization - Part 1: Rules for the structure and drafting of standardizing documents".

This document replaces GB/T 31531-2015 "Determination of quinoline in dyestuffs and textile dyeing and finishing auxiliaries". Compared to GB/T 31531-2015, in addition to structural adjustments and editorial changes, the main technical changes in this document are as follows:

a) Changed the scope of application of the standard (see Chapter 1 of this Edition; Chapter 1 of Edition 2015);

b) Added the method for determining the content of isoquinoline (see Chapter 4 of this Edition);

c) Changed the content of quinoline (see 4.3.1 of this Edition; 3.3.1 of Edition 2015);

d) Changed the packing material for capillary columns (see 4.4.2 of this Edition; 3.4.3 of Edition 2015);

e) Changed the gas chromatography operating conditions (see 4.5 of this Edition; 3.5 of Edition 2015);

f) Changed the calculation formula (see 4.9 of this Edition; 3.9 of Edition 2015);

g) Changed the recovery of quinoline (see 5.2 of this Edition; 4.2 of Edition 2015);

h) Changed the precision of quinoline (see 5.3 of this Edition; 4.3 of Edition 2015);

i) Added the recovery of isoquinoline, precision (see Chapter 5 of this Edition).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority shall not be held responsible for identifying any or all such patent rights.

This document was proposed by China Petroleum and Chemical Industry Federation.

This document shall be under the jurisdiction of National Technical Committee on Dyestuffs of Standardization Administration of China (SAC/TC 134).

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# Determination of quinoline and isoquinoline in dyestuffs and textile dyeing and finishing auxiliaries

**WARNING -- Personnel using this document shall have practical experience in formal laboratory work. This document does not address all possible safety issues. Users are responsible for taking appropriate safety and health measures and ensuring compliance with relevant national regulations.**

## 1 Scope

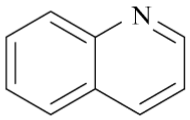
This document describes the method for the determination of free quinoline and isoquinoline content in dyestuffs and textile dyeing and finishing auxiliaries.

This document is applicable to the determination of free quinoline and isoquinoline content in various dosage forms of dyes, dye products, and textile dyeing and finishing auxiliaries.

Molecular formula: $C_9H_7N$

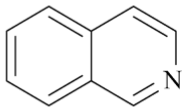
Structural formula:

Quinoline



CAS No.: 91-22-5 (quinoline)

Isoquinoline



119-65-3 (isoquinoline)

Relative molecular mass: 129.16 (according to the 2022 international relative atomic mass)

## 2 Normative references

The following referenced documents are indispensable for the application 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.

GB/T 6682-2008, *Water for analytical laboratory use -- Specification and test methods*

GB/T 8170-2008, *Rules of rounding off for numerical values and expression and*

*judgement of limiting values*

GB/T 9722-2023, *Chemical reagent - General rules for the gas chromatography*

# 3 Terms and definitions

There are no terms or definitions that require definition in this document.

# 4 Test methods

## 4.1 General

Unless otherwise specified, only reagents that are confirmed as analytically pure and Grade 3 water as specified in GB/T 6682-2008 shall be used. Test results shall be determined using the rounded value comparison method described in 4.3.3 of GB/T 8170-2008.

## 4.2 Principle

The specimen is extracted with an organic solvent in an aqueous solution to remove free quinoline and isoquinoline. Gas chromatography is used for analysis. Peak area is quantified using an external standard method.

## 4.3 Reagents and materials

**4.3.1** Quinoline: content ≥ 98% (mass fraction).

**4.3.2** Isoquinoline: content ≥ 98% (mass fraction).

**4.3.3** Ethyl acetate.

## 4.4 Instruments and equipment

**4.4.1** Gas chromatograph: the performance and stability of the instrument shall comply with the requirements of 6.2 and 6.4 of GB/T 9722-2023.

**4.4.2** Capillary column: 30 m long, 0.32 mm inner diameter, 1.0 μm film thickness. Stationary Phase: 5% phenyl-95% methylpolysiloxane, or other capillary column capable of achieving equivalent separation performance.

**4.4.3** Detector: flame ionization detector (FID).

**4.4.4** Microsyringe or autosampler.

**4.4.5** Chromatographic workstation or integrator.

## 4.5 Gas chromatography operating conditions

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