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

GB/T 21852-2025

Replacing GB/T 21852-2008

**Chemicals - Partition coefficient (n-octanol/water) - High
performance liquid chromatography (HPLC) method**

化学品 分配系数（正辛醇-水）高效液相色谱法试验

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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 replaces GB/T 21852-2008 "Partition Coefficient of Chemicals (n-Octanol-Water) - Test by High Performance Liquid Chromatography".

Compared with GB/T 21852-2008, apart from structural adjustments and editorial changes, the main technical changes are as follows.

- a) The statement "pH-metric methods can also be used to determine the partition coefficient of ionic chemicals" has been deleted (see section 3.1 of the 2008 edition).
- b) The calculation of lgPow has been modified (see Chapter 4, 3.1 of the 2008 edition);
- c) The content regarding "Determination of Dead Time t₀" has been revised (see 8.2, 6.3 of the 2008 version);
- d) The content of "Data and Reporting" has been changed (see Chapter 10, Chapter 8 of the 2008 edition).

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 Hazardous Chemicals Management (SAC/TC251).

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The release history of this document and the document it replaces is as follows.

- First published in 2008 as GB/T 21852-2008;
- This is the first revision.

Partition coefficient of chemicals (n-octanol-water) High performance liquid chromatography test

1 Scope

This document establishes the experimental principle for the high-performance liquid chromatography (HPLC) test of the partition coefficient (n-octanol-water), and specifies the test molecule information.

Requirements for information, reference materials, test preparation, test procedures, quality assurance and quality control, and data and reporting content.

This document applies to the determination of the partition coefficient of chemical substances with lgPow values ranging from 0 to 6. In special cases, it can be extended to lgPow values ranging from 0 to 6.

Chemicals with a strength of 6-10; not suitable for strong acids, strong bases, metal complexes, chemicals that react with eluents, and surfactants.

2 Normative references

GB/T 21853

GB/T 21855

3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 partition coefficient

The ratio of the concentrations of the test substance when they reach equilibrium in two immiscible phase media.

3.2 t_R --- Retention time of the test substance;

The ratio of the concentrations of the test substance when it reaches equilibrium in a two-phase medium of n-octanol and water.

Note. Represented by Pow . Pow is dimensionless and is usually represented by the logarithm to base 10 ($\lg Pow$).

4 Experimental Principle

The HPLC method described in this document is a separation process performed on an analytical column packed with a silica stationary phase bonded with long hydrocarbon chains. Test analytes After entering the chromatographic column, the chemical substance partitions between the solvent mobile phase and the hydrocarbon stationary phase as it moves along the column.

The retention time in the column is proportional to its hydrocarbon-water partition coefficient; hydrophilic chemicals are eluted first, followed by lipophilic chemicals.

The relationship between residence time and dead time is represented by the capacity factor k , as shown in formula (1). $k = \frac{t_R - t_0}{t_0}$ (1) In the formula. k --- capacity factor;

t_R --- Retention time of the test substance;