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

GB/T 36214.2-2018

**Plastics -- Determination of average molecular mass and
molecular mass distribution of polymers using size-exclusion
chromatography -- Part 2: Universal calibration method**

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Foreword

GB/T 36214 "Plastics volume exclusion chromatography for the determination of the average molecular weight and molecular weight distribution of polymers" is divided into five parts.

--- Part 1. General;

--- Part 2. Universal Correction Method;

--- Part 3. Low temperature method;

--- Part 4. High temperature method;

--- Part 5. Light scattering method.

This part is the second part of GB/T 36214.

This part is drafted in accordance with the rules given in GB/T 1.1-2009.

This section uses the translation method equivalent to ISO 16014-2:2012 "plastic volume exclusion chromatography to determine the average molecular weight of the polymer

And molecular weight distribution Part 2. Universal Correction Act.

This part was proposed by the China Petroleum and Chemical Industry Federation.

This part is under the jurisdiction of the National Plastics Standardization Technical Committee (SAC/TC15).

This section was drafted by. China National Petroleum Corporation Petrochemical Research Institute, Tongdao Technology Chengdu Co., Ltd., China Blue

Star (Group) Co., Ltd., Beijing Puli Taike Instrument Co., Ltd., Guangzhou Quality Supervision and Inspection Institute.

1 Scope

This part of GB/T 36214 specifies a method for determining the average molecular weight

and molecular weight distribution of polymers by volume exclusion chromatography (SEC).

Methods. The method uses a universal calibration curve instead of a conventional calibration curve to calculate the average molecular weight and molecular weight distribution.

Note 1. The bibliography related to this section is listed in the bibliography.

Note 2. The principle of the universal calibration method is based on the retention time of the polymer on the SEC depending on the molecular size of the polymer (fluidic volume) or the intrinsic viscosity

The product of $[\eta]$ and the molecular weight M . Experiments have demonstrated many random coil polymers (regardless of their chemical structure, degree of branching, composition or stereoregularity)

Sex) conforms to this correspondence. The universal calibration curve is the use of polymer standards such as narrow molecular weight distribution polystyrene, eluted by $\lg([\eta]M)$

Inter-t or elution volume V is plotted. The molecular weight M_i of the unknown polymer sample can be corrected by the corresponding elution time on the universal calibration curve.

$[\eta]M$ value and intrinsic viscosity $[\eta]$ or Mark-Houwink-Sakurada formula $([\eta] = K M^\alpha \rightarrow [\eta] M =$

K and α in $K M^\alpha$) are calculated, where K is a constant and α is an index dependent on the experimental conditions. Therefore, this test method is as GB/T 36214.1

Described in this is a relative method in which the calculated average molecular weight and molecular weight distribution are equal to or close to their absolute values.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 36214.1-2018 Determination of the average molecular weight and molecular weight distribution of polymers by volume exclusion chromatography - Part 1.

General Principles (ISO 16014-1.2012, IDT)

GB/T 36214.3-2018 Determination of the average molecular weight and molecular weight distribution of polymers by volume exclusion chromatography - Part 3.

Low temperature method (ISO 16014-3.2012, IDT)

GB/T 36214.4-2018 Determination of the average molecular weight and molecular weight distribution of polymers by volume exclusion chromatography - Part 4.

High temperature method (ISO 16014-4.2012, IDT)

ISO 472 plastic terminology and its definition (Plastics-Vocabulary)

3 Terms and definitions

The terms and definitions defined in ISO 472 and GB/T 36214.1-2018 apply to this document. For the convenience of using this section, here again

The definitions of the different average molecular weights are listed.

The following formula defines four average molecular weights, N_i refers to the number of i -type molecules with a molecular weight of M_i , and α is Mark-Houwink-Sakurada

(Mark-Houwink-Sakurada) The index in the formula.

Note. Although the formula is the same as in GB/T 36214.1, the M_i value in the following formula is calculated using the pervasive calibration curve described in Chapter 4.