

ICS 83.080.01

CCS G 31



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

GB/T 8144-2008

Determination of exchange capacity of cation exchange resins

阳离子交换树脂交换容量测定方法

Issued on: June 30, 2008

Implemented on: February 1, 2009

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine;
Standardization Administration of the PRC**

Table of Contents

- 1 Scope
- 2 Normative references
- 3 Method Summary
- 4 Instrument

Foreword

This standard replaces GB/T 8144-1987 "ion exchange resins Determination of exchange capacity." This standard compared with GB/T 8144-1987 standard, the main changes are as follows:

--- Increasing the exchange capacity determination of sodium cation exchange resin. The standard proposed by China Petroleum and Chemical Industry Association. This standard by the National Standardization Technical Committee plastic universal methods and products Club (SAC/TC15/SC4) centralized. This standard is mainly drafted by: Xi'an Thermal Power Research Institute Co., Ltd., Jiangsu Su Qing water treatment engineering company, Zhejiang Industrial glory for shares Parts Limited, East Zibo Chemical Co., Ltd., the national quality inspection center of a synthetic resin. The main drafters of this standard. Wang Guang Zhu, Qian Ping, Cai Xiaohua, Shen Jianhua, Cuihuan Fang, Di Jinghua, Wang Jiandong. This standard replaces the standards previously issued as follows:

--- GB/T 8144-1987. Exchange capacity of the cation exchange resin Determination

1 Scope

China's national method for determining the exchange capacity of cation exchange resins. Exchange capacity is what a resin is bought for: the number of ionic sites per unit volume or mass, which fixes how much hardness a softener will remove before it must be regenerated, how much a demineraliser will hold, and therefore the size of the vessel and the cost of the plant. Measuring it is a titration in principle and a matter of technique in practice, because the resin has to be converted completely into a known ionic form first and then exhausted completely, and an incompletely converted bed reads low. The two resin families behave differently and are treated separately: a styrene strong acid resin is fully ionised at any pH and gives up its hydrogen readily, while an acrylic weak acid resin only works above about pH 4 and has a much higher capacity when it does. The standard specifies the determination for styrenic strong acid resins in the hydrogen and sodium forms and for acrylic weak acid resins.

This standard specifies the styrene strong acid and sodium hydrogen type cation exchange resin, an acrylic weakly acidic cation exchange resin cross Determination of exchange capacity. This standard applies to styrene strong acid and sodium hydrogen type cation exchange resin, an acrylic weakly acidic cation exchange resin exchange Determination of capacity.

2 Normative references

The following documents contain provisions which, through reference in this standard and become the standard terms. For dated references, subsequent Amendments (not including errata content) or revisions do not apply to this standard, however, encourage the parties to the agreement are based on research Whether the latest versions of these documents. For undated reference documents, the latest versions apply to this standard. Preparation of

GB/T 601 chemical reagent standard solution

GB/T 603 chemical reagent test methods and products in the preparation Preparation

GB/T 5475 sampling ion exchange resin Resin pretreatment method

GB/T 5476 ion exchange Resin Determination for water

GB/T 5757 ion exchange Determination of exchange capacity of the resin

GB/T 5760 OH anion exchange Laboratory use specifications and test methods GB/T 6682 Analysis

3 Method Summary

3.1 Determination SUMMARY hydrogen type cation exchange resin exchange capacity

When hydrogen type cation exchange resin with an excess of (quantitative) monobasic strong base (such as sodium hydroxide) solution reaction, according to the titration of unreacted The calculated amount of base cation exchange resin Total exchange capacity, which is the reaction formula. $\rightarrow \text{RH} + \text{NaOH} \rightarrow \text{RNa} + \text{H}_2\text{O}$ Where. The RH

--- represents a cation exchange resin (hydrogen form), which functional group may be a sulfonic acid group and/or carboxyl and phenolic groups; RNa

--- represents a cation exchange resin (sodium form). When hydrogen type cation exchange resin is soaked in a solution of calcium chloride, only the strong acid groups (sulfonic acid group) can react, the replacement of titration To hydrogen ions (H^+), strong acid cation exchange resin computing group exchange capacity. Their reaction is. $2\text{RH} + \text{CaCl}_2 \rightarrow 2\text{R}_2\text{Ca} + 2\text{HCl}$ In total exchange capacity of the cation exchange resin with a strong acid group exchange capacity of the difference between the calculated exchange capacity of weak acid groups. Method

3.2 Determination of sodium cation exchange resin exchange capacity Summary Sodium

cation exchange resin under the dynamic by excess 1mol/LHCl regeneration solution, and then water to wash away the excess amount of HCl solution Liquid resin into the hydrogen form. Under the dynamic by excess 1mol/LNaCl solution, exchange group is substituted with hydrogen ions to sodium ions dissolved Solution, the reaction is as follows: $\rightarrow RH + NaCl \rightarrow RNa + HCl$ All effluent was collected, the hydrogen amount was measured for calculating ion exchange capacity of the whole resin.

4 Instrument

4.1 Glass-exchange column. see GB/T 5760.