ICS 71.100.40
CCS G73

NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 15045-2013

Replacing GB/T 15045-1994

Fatty alkyl dimethyl tertiary amines

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Issued on: December 31, 2013 **Implemented on: December 1, 2014**

Issued by: General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China;
Standardization Administration of China

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Foreword

This Standard is drafted in accordance with the rules specified in GB/T 1.1-2009. This Standard replaces GB/T 15045-1994 Fatty Alkyl Dimethyl Tertiary Amines. Compared with GB/T 15045-1994, this Standard has the following main changes. -- Product categories have been increased from 6 to 12 (see 3.2,

3.2 of edition-1994); -- Product grades have been reduced from 3 to 1 (see Chapter 4 of this Standard; Chapter 4 of edition-1994); -- Color indexes of the qualified products have been altered (see Chapter 4 of this Standard; Chapter 4 of edition-1994); -- The content indexes of tertiary amine, primary and secondary amine, and main constituents have been

altered (see Chapter 4 of this Standard; Chapter 4 of edition-1994); -- Free alcohols indexes have been increased (see Chapter 4 of this Standard); -- The tertiary amine value required in the original standard has been changed into the total amine value (see Chapter 4 of this Standard; Chapter 4 of edition-1994); -- The analysis methods of primary and secondary amine have been altered (see 5.4,

5.5 of edition-1994); -- The requirements for hetero-carbon not on the main carbon chain have been deleted; -- The chromatographic column requirements in the test methods of main constituents have been altered (see 5.5,

5.4 of edition-1994). This Standard was proposed by China Light Industry Council. This Standard shall be under the jurisdiction of China National Technical Committee for Standardization of Surfactant and Cleaning Products (SAC/TC 272). Drafting organizations of this Standard. Rhodia Feixiang Fine Chemicals Co., Ltd., Productivity Promotion Center of Surfactants & Detergents and China Research Institute of Daily Chemical Industry, and National Cleaning Products Quality Supervision and Inspection Center (Taiyuan). Main drafters of this Standard. Ma Lin, Yao Chenzhi, Wang Zhijun. Previous version replace by this Standard is as follows: -- GB/T 15045-1994. Fatty Alkyl Dimethyl Tertiary Amines

1 Scope

GB/T 15045-2013 is the Chinese national standard on fatty alkyl dimethyl tertiary amines, in the field of chemical technology. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 31 December 2013 by the General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China; Standardization Administration of China, and has been in force since 1 December 2014. Classification: ICS 71.100.40, CCS G73. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Standard specifies the product category, technical requirements, test methods, inspection rules, marks, packaging, transport, storage and guarantee period of fatty alkyl dimethyl tertiary amines. This Standard applies to fatty alkyl dimethyl tertiary amines (N,N-dimethyl alkyl tertiary amine) produced by fatty alcohols or fatty acid, which are mainly used to produce cationic surfactants, zwitterionic surfactants, non-ionic surfactants, antistatic agents, etc. This Standard does not apply to fatty alkyl dimethyl tertiary amines produced by oxo-synthesis alcohols.

2 Normative references

The following documents are indispensable for application of this document. For the dated documents so quoted, only dated versions apply to this document. For the undated documents so quoted, the latest versions (including all modification sheets) apply to this document.

GB/T 3143 Color determination method of liquid chemicals (Hazen unit - Platinum-cobalt scale)

GB/T 6682 Water for laboratory use; Specifications QB/T 2739 Preparations of standard volumetric solutions of general test methods for washing products

3.1 Structural formula CH3 N -R (R=CnH2n+1, n=even number between 8 and 24) CH3

3.2 Categories and codes Fatty alkyl dimethyl tertiary amines can be divided into 12 categories according to the fatty alkyl carbon atom numbers and main constituents. Categories and codes are as follows: Tertiary amine

5.3.2.4 Standard solution of HCl- isopropyl alcohol-ethylene glycol, c =

0.15 mol/L. Add prepared HCl into the mixed solution of ethylene glycol and isopropyl alcohol (1.1, volume fraction); shake well; then conduct calibration in accordance with the provisions of QB/T 2739. The standard solution shall be sealed and stored in the refrigerator at about 10°C to avoid volatilization of the solvents due to high temperature. Before use, the standard solution shall be placed in room temperature to let it recover to the room temperature; the validity is 1 month.

5.3.3 Instruments

5.3.3.1 Titration vessel or beaker, 100 mL.

5.3.3.2 Graduated cylinder, 50mL.

5.3.3.3 Acidometer.

5.3.4 Test procedures Weigh

0.2 g~

0.3 g (less low-molecular-weight sample and more high-molecular-weight sample) of evenly melted and mixed sample (precision. 0.0001g); add into a 100 mL titration vessel or beaker; slowly add in 10 mL of acetic anhydride (if there is any solid in the sample, it shall be heated in hot water till melted); shake well; let the solution stay in room temperature for 15 min; then add in 50 mL of isopropyl alcohol solution; put it on the acidometer; conduct potentiometric titration by using standard solution of HCl- isopropyl alcohol-ethylene glycol (5.3.2.4) until the potential jumps to the maximum value; then write down the volume of

standard solution of HCl- isopropyl alcohol-ethylene glycol that has been used in the titration (V1). Weigh another sample with an equivalent mass; without adding acetic anhydride, repeat the above test steps; write down the volume of standard solution of HCl-isopropyl alcohol-ethylene glycol that has been used in the titration (V2). titration, unit. mL; c- The molar concentration of standard solution of NaOH-ethyl alcohol, unit. mol/L; M- The molar mass of fatty alkyl dimethyl tertiary amine, unit. g/mol; m3 - The mass of the sample, unit. g. The arithmetic mean value of two parallel determination results shall be used to express the determination results, correcting to one decimal place.

5.4.6 Degree of precision The absolute difference of two independent tests' results obtained under the same conditions shall not be more than 0.03%, which is on the premise that the probability with absolute difference more than 0.03% does not exceed 5%.

5.5 Main constituents, free alcohols and average relative molecular mass

5.5.1 Principle Separate the sample with chromatographic column; calculate the average relative molecular mass, main constituent content and free alcohol content through chromatogram peak area.

5.5.2.1 Absolute ethyl alcohol

5.5.2.2 Reference sample. fatty alkyl dimethyl tertiary amine and fatty alcohol with known chain length, taking the sample with known constituents as the reference sample to determine the performance of the chromatographic instrument.

5.5.2.3 Carrier gas, nitrogen, fuel gas, hydrogen, oxidant gas, air.

5.5.3 Instruments

5.5.3.1 Chromatographic instrument, with flame ionization detector and programmed temperature.

5.5.3.2 Chromatographic column. HP-5 can be used for analyzing C8-C18, specification. 30 mx

0.32 mmx0.5μm or equivalence, Rtx-200 can be used for analyzing C18/22 and C22, specification. 30 mx

0.53 mmx0.5μm or equivalence.

5.5.3.3 Chromatographic processor or chromatographic work station.

5.5.4 Chromatographic conditions The typical reference conditions for chromatographic analysis are as follows; necessary

5.5.7 Degree of precision