Toiduga kokkupuutuvad materjalid ja esemed. Epoksiidi derivaadid, mille kasutamist tuleb piirata. NOGE ja selle vesinikku ja kloori sisaldavate derivaatide määramine

Materials and articles in contact with foodstuffs - Certain epoxy derivatives subject to limitation - Determination of NOGE and its hydroxy and chlorinated derivatives

EESTI STANDARDI EESSÕNA **NATIONAL FOREWORD**

Käesolev Eesti standard EVS-EN 15137:2006 sisaldab Euroopa standardi EN 15137:2006 ingliskeelset teksti. Käesolev dokument on jõustatud 28.04.2006 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-EN 15137:2006 consists of the English text of the European standard EN 15137:2006. This document is endorsed on 28.04.2006 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.

Käsitlusala: This European standard describes the determination of NOGE components with more than two aromatic rings (the two-ring NOGE is equal to BFDGE = Bis(2-hydroxyphenyl)methane bis(2,3-epoxypropyl)ether) and at least one epoxy group as well as their derivatives containing chlorohydrin functions and having a molecular mass less than 1000 Daltons in can coatings.	**Scope:** This European standard describes the determination of NOGE components with more than two aromatic rings (the two-ring NOGE is equal to BFDGE = Bis(2-hydroxyphenyl)methane bis(2,3-epoxypropyl)ether) and at least one epoxy group as well as their derivatives containing chlorohydrin functions and having a molecular mass less than 1000 Daltons in can coatings.

ICS 67.250, 71.040.40

Võtmesõnad:

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15137

March 2006

ICS 67.250; 71.040.40

English Version

Materials and articles in contact with foodstuffs - Certain epoxy derivatives subject to limitation - Determination of NOGE and its hydroxy and chlorinated derivatives

Matériaux et objets en contact avec des denrées alimentaires - Dérivés époxy soumis à des limitations - Détermination des NOGE et de leurs dérivés hydroxylés et chlorés

Werkstoffe und Gegenstände in Kontakt mit Lebensmitteln - Bestimmte Epoxyderivate, die Beschränkungen unterliegen - Bestimmung von NOGE und dessen Hydroxy- und Chlorderivaten

This European Standard was approved by CEN on 23 January 2006.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Ref. No. EN 15137:2006: E

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Foreword

This document (EN 15137:2006) has been prepared by Technical Committee CEN/TC 194 “Utensils in contact with food”, the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2006, and conflicting national standards shall be withdrawn at the latest by September 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

This document should be read in conjunction with EN 13130-1.

WARNING: All chemicals are hazardous to health to a greater or lesser extent. It is beyond the scope of this European standard to give instructions for the safe handling of all chemicals, that meet, in full, the legal obligations in all countries in which this European standard may be followed. Therefore, specific warnings are not given and users of this European standard should ensure that they meet all the necessary safety requirements in their own country.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

NOGE (Novolac glycidyl ethers) is used as a monomer in the manufacture of certain polymeric food contact materials and articles.

The main application of NOGE is in epoxy coatings for cans and ends. The substance may also be used in organosol coatings.

After the manufacture, residues of NOGE or its reaction products can remain in the finished product and may migrate into foodstuffs coming into contact with that product.

The analytical method described allows for the determination NOGE and its reaction products in can coatings.

1 Scope

This European standard describes the determination of NOGE components with more than two aromatic rings (the two-ring NOGE is equal to BFDGE = Bis(2-hydroxyphenyl)methane bis(2,3-epoxypropyl)ether) and at least one epoxy group as well as their derivatives containing chlorohydrin functions and having a molecular mass less than 1000 Daltons in can coatings.

A high performance liquid chromatography (HPLC) method is employed based on reversed phase HPLC and fluorescence detection.

The method is capable of determining NOGE and its derivatives at a minimum level of 1 μg/ml in solution.

Direct HPLC analysis of the can coating extract may result in chromatograms difficult to interpret, due to interference from other components or the instability of the monomer resulting in a complex mixture of derivatives and/or reaction products. By forced hydrolysis of all epoxy groups and their reaction products, the quantification of the NOGE is simplified and the identities of the substances are indicatively confirmed.

NOTE In this European standard the term “NOGE and its derivatives” refers to the requirements of Directive 2002/16/EC [1] and its amendment, Directive 2004/13/EC [2]. This includes NOGE components with more than two aromatic rings and at least one epoxy group as well as their derivatives containing chlorohydrin functions and having a molecular mass less than 1000 Daltons.

2 Normative references

The following referenced documents are indispensable for the application of this European standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 13130-1:2004, *Materials and articles in contact with foodstuffs – Plastics substances subject to limitation – Part 1: Guide to the test methods for the specific migration of substances from plastics to foods and food simulants and the determination of substances in plastics and the selection of conditions of exposure to food simulants*

3 Principle

3.1 Determination of NOGE and derivatives in a can coating

Can coatings are extracted with acetonitrile for 24 h at room temperature. Then the extraction solvent is injected into a reverse phase HPLC column. The substances are separated using a gradient elution profile. Detection is performed by means of fluorescence detection. Identification is based on retention time and comparison with reference substances, fluorescence and UV detection response. For confirmation and quantification of NOGE and derivatives the epoxy and the chlorohydrin containing components are fully hydrolysed in alkaline medium at elevated temperature to form the diol components. The hydrolysed components (NOGE per H_2O) are separated by HPLC using fluorescence detection. The NOGE per H_2O components will appear early in the chromatogram due to the increased polarity of the hydrolysed components. Compared to the HPLC chromatogram prior to hydrolysis a simpler HPLC chromatogram is obtained after hydrolysis, containing fewer peaks because all epoxy components and chlorohydrin derivatives disappear; if a peak remains then this substance shall be considered an interfering substance originating from the matrix. To establish compliance with the restrictions set the total amount of diol substances is determined. If relevant, the total amount of NOGE per H_2O derivatives is reduced with the amount of NOGE per H_2O derivatives present initially, prior to hydrolysis.