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Vinegar – Isotopic analysis of acetic acid and water – Part 1: ^2H -NMR analysis of acetic acid

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EUROPEAN STANDARD

EN 16466-1

NORME EUROPÉENNE

EUROPÄISCHE NORM

January 2013

ICS 67.220.10

English Version

Vinegar - Isotopic analysis of acetic acid and water - Part 1:
²H-NMR analysis of acetic acid

Vinaigre - Analyse isotopique de l'acide acétique et de l'eau -
Partie 1: Analyse RMN-²H de l'acide acétique

Essig - Isotopenanalyse von Essigsäure und Wasser - Teil 1:
²H-NMR-Analyse von Essigsäure

This European Standard was approved by CEN on 3 November 2012.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (EN 16466-1:2013) has been based on an international collaborative study of the methods published in *Analytica Chimica Acta* 649 (2009) 98-105, and organised under the auspices of the Permanent International Vinegar Committee (CPIV, Brussels).

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of an identical text or by endorsement, at the latest by July 2013, and conflicting national standards shall be withdrawn at the latest by July 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

The European standard, *Vinegar — Isotopic analysis of acetic acid and water*, consists of the following parts:

- *Part 1: ²H-NMR analysis of acetic acid;*
- *Part 2: ¹³C-IRMS analysis of acetic acid;*
- *Part 3: ¹⁸O-IRMS analysis of water.*

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Introduction

Vinegar is defined in EN 13188 as the acetic acid solution resulting from a double fermentation:

- a) transformation of sugars to ethanol and
- b) transformation of ethanol to acetic acid.

Conversely, EN 13189 defines acetic acid as "Product made from materials of non-agricultural origin".

Wine vinegar is defined by the European Regulations 479/2008 and 491/2009 as the product obtained exclusively from the acetous fermentation of wine, which is in turn defined as the product exclusively obtained from the alcoholic fermentation of fresh grapes, whether crushed or not, or of grape must.

In all types of vinegar, both the ethanol and the acetic acid should be obtained by a biotechnological process, and the use of acetic acids obtained from either petroleum derivatives or the pyrolysis of wood is not permitted according to the above definitions.

The isotopic analysis of acetic acid extracted from vinegar by ^2H -SNIF-NMR and ^{13}C -IRMS enables the distinction of grape origin from other sources, such as beet, cane, malt, apple and synthesis [1].