



BSI Standards Publication

**Organic and organo-mineral fertilizers —
Determination of the biuret content by high-
performance liquid chromatography (HPLC)**

National foreword

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The UK participation in its preparation was entrusted to Technical Committee CII/37, Fertilisers and related chemicals.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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English Version

**Organic and organo-mineral fertilizers - Determination of
 the biuret content by high-performance liquid
 chromatography (HPLC)**

Engrais organiques et organo-minéraux -
 Détermination de la teneur en biuret

Organische und organisch-minerale Düngemittel -
 Bestimmung des Biuretgehalts

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European foreword

This document (CEN/TS 17765:2022) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN.

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Introduction

Regulation (EU) 2019/1009 [4] lays down the rules on the making available on the market of EU fertilizing products and the specific safety and quality requirements for the defined product function categories (PFCs). Organic and organo-mineral fertilizers have been classified as PFC 1(A) and PFC 1(B).

This document defines test methods for the determination of the biuret content to be used for organic and organo-mineral fertilizers in order to measure the compliance with the related requirement in Regulation (EU) 2019/1009 [4].

When heating urea near or above its melting point (132 °C) during the manufacturing of urea, ammonia slowly evolves and several different substances, including biuret, are formed. Excessively high concentrations of biuret can have detrimental effects on plants growth.

1 Scope

This document is applicable to fertilizing products, which are classified as PFC 1(A) and PFC 1(B) or the PFC 1(A) and PFC 1(B) component in PFC 7 of Regulation (EU) 2019/1009 [4]. However, the present method was not validated for blends.

This document specifies a method for the determination of the biuret content by high-performance liquid chromatography (HPLC) with UV detector. The method is applicable to organic and organo-mineral fertilizers containing urea.

Nowadays, there is a method standardized as EN 15479 that allows the determination of biuret in urea by spectrophotometric detection. Organic and organo-mineral fertilizers contain organic matter and other compounds apart from urea that would interfere in a spectrophotometric method. HPLC allows an accurate determination of biuret by separating it from possible interfering compounds [21] [22].

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3696:1995, *Water for analytical laboratory use — Specifications and test methods (ISO 3696:1987)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

biuret

imidodicarbonic diamide

member of the class of condensed ureas

Note 1 to entry: Condensed ureas are the compounds formed by the condensation of two molecules of urea.

4 Principle

The biuret content of the fertilizer sample is extracted with an aqueous acetonitrile solution and separated by reversed-phase liquid chromatography. Detection of peaks is performed using an ultraviolet (UV) detector. Quantification is performed with calibration curve using external standards.

5 Reagents

All water used shall be grade 3 according to EN ISO 3696:1995. All reagents shall be of recognized analytical grade.

5.1 Acetonitrile, HPLC grade, $\geq 99,9\%$.