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**Organsko-mineralna gnojila - Ekstrakcija fosforja, topnega v nevtralnem amonijevem citratu**

Organo-mineral fertilizers - Extraction of phosphorus, which is soluble in neutral ammonium citrate

Organisch-mineralische Düngemittel - Extraktion von Phosphor, der in neutralem Ammoniumcitrat löslich ist

Engrais organo-minéraux - Extraction du phosphore, qui est soluble dans le citrate d'ammonium neutre

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**Ta slovenski standard je istoveten z: CEN/TS 17779:2022**

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**ICS:**

65.080

Gnojila

Fertilizers

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TECHNICAL SPECIFICATION  
SPÉCIFICATION TECHNIQUE  
TECHNISCHE SPEZIFIKATION

**CEN/TS 17779**

April 2022

ICS 65.080

English Version

**Organo-mineral fertilizers - Extraction of phosphorus,  
which is soluble in neutral ammonium citrate**

Engrais organo-minéraux - Extraction du phosphore,  
qui est soluble dans le citrate d'ammonium neutre

Organisch-mineralische Düngemittel - Extraktion von  
Phosphor, der in neutralem Ammoniumcitrat (NAC)  
löslich ist, zur anschließenden Bestimmung von P  
durch ICP-AES

This Technical Specification (CEN/TS) was approved by CEN on 13 March 2022 for provisional application.

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

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## European Foreword

This document (CEN/TS 17779:2022) has been prepared by the Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN

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## CEN/TS 17779:2022 (E)

## 1 Scope

This document specifies a method for the extraction of phosphorus soluble in neutral ammonium citrate. The method is applicable to organo-mineral fertilizers.

## 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.

CEN/TS 17774, *Organic and organo-mineral fertilizers — Determination of the content of specific elements by ICP-AES after extraction by water*

## 3 Terms and definitions

No terms and definitions are listed in this document.

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

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

## 4 Principle

The principle is to perform the extraction of phosphorus at a temperature of 65 °C using a neutral ammonium citrate solution of pH = 7 under the specified conditions.

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## 5 Sampling

Sampling should be performed carefully, following the principle described in EN 1482 (all parts) with appropriate adaptations, required to account for specificities of organo-mineral fertilizers.

## 6 Reagents

### 6.1 Water.

**6.2 Neutral ammonium citrate solution**, pH = 7, containing 185 g crystallized citric acid per litre, specific gravity 1,09 at 20 °C.

Prepare the reagent as follows:

Dissolve 370 g of crystalline citric acid ( $C_6H_8O_7 \cdot H_2O$ ) in about 1,5 l of water and make an approximately neutral solution by adding 345 ml of ammonium hydroxide solution (28 % to 29 % of  $NH_3$ ). If the  $NH_3$  concentration is lower than 28 % add a correspondingly larger quantity of ammonium hydroxide solution and dilute the citric acid in correspondingly smaller quantities of water.

Cool and make exactly neutral by keeping the electrodes of a pH-meter immersed in the solution. Add the ammonia, at 28 % to 29 % of  $NH_3$ , drop by drop, stirring continuously (with a mechanical stirrer) until obtaining exactly a pH of 7 at a temperature of 20 °C. At this point make up the volume to 2 l and check the pH again. Keep the reagent in a closed container and check the pH at regular intervals.

## 7 Apparatus

- 7.1 **Beaker**, capacity 2 l.
- 7.2 **pH-meter**.
- 7.3 **Erlenmeyer flask**, capacity 200 ml or 250 ml.
- 7.4 **Graduated flasks**, capacity 500 ml and 2 000 ml.
- 7.5 **Water bath**, to be set thermostatically at  $(65 \pm 2) ^\circ\text{C}$ , equipped with a suitable stirrer.
- 7.6 **Dry pleated filter**, medium speed, phosphate free.

## 8 Procedure

### 8.1 Test portion

Transfer 1 g or 3 g (for fertilizers with pure or partially digested rock phosphate) with an accuracy of 0,01 g of the laboratory sample to be analysed into a 200 ml or 250 ml Erlenmeyer flask (7.3) containing 100 ml of ammonium citrate solution (6.2) previously heated to  $(65 \pm 2) ^\circ\text{C}$ .

### 8.2 Extraction

Stopper the Erlenmeyer flask (7.3) and shake in order to suspend the test portion without forming lumps. Remove the stopper for an instant in order to balance the pressure and close the Erlenmeyer flask again. Place the flask in a water bath (7.5) set to maintain the contents of the flask at exactly  $65 ^\circ\text{C}$  and connect it to the stirrer. During stirring, the level of the suspension in the flask shall stay constantly below the level of the water in the water bath. If a mechanical stirrer is not available, the flask may be shaken by hand every 5 min.

Regulate mechanical stirring to ensure complete suspension.

After stirring for exactly 1 h, remove the Erlenmeyer flask from the water bath.

Cool immediately under running water to ambient temperature and, immediately, quantitatively transfer the contents from the Erlenmeyer flask into a graduated 500 ml flask (7.4) with a jet of water (wash bottle). Make up the volume with water. Mix thoroughly. Filter through a dry pleated filter (7.6) into a dry container, discarding the first part of the filtrate (about 50 ml).

Collect about 100 ml of clear filtrate.

The determination of phosphorus after extraction shall be done according to CEN/TS 17774.