International Standard 7497

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Fertilizers — Extraction of phosphates soluble in mineral acids

Engrais — Extraction des phosphates solubles dans les acides minéraux

First edition — 1984-11-01

UDC 631.8 : 543.722 : 546.185 **Ref. No. ISO 7497-1984 (E)**

Descriptors : fertilizers, tests, extraction, soluble matter, orthophosphates.

Price based on 2 pages

Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7497 was prepared by Technical Committee ISO/TC 134, *Fertilizers and soil conditioners.*

Printed in Switzerland

Fertilizers — Extraction of phosphates soluble in mineral acids

0 Introduction

The two methods specified in this International Standard have been recognized as equivalent for the extraction of mineral acid-soluble phosphates.

1 Scope and field of application

This International Standard specifies a method for the extraction of mineral acid-soluble phosphates by attack with a mixture of hydrochloric and nitric acids and a method by attack with a mixture of sulfuric and nitric acids.

These methods are applicable to all phosphate fertilizers and to mineral phosphates containing low amounts of organic matter.

2 Method A: Hydrochloric acid/nitric acid attack

2.1 Principle

Dissolution of the phosphates present in fertilizers or in mineral phosphates in a mixture of hydrochloric and nitric acids.

2.2 Reagents

All reagents shall be of recognized analytical grade, and the water used shall be distilled water or demineralized water of equivalent purity.

Acid mixture.

Add 3 volumes of nitric acid (ϱ_{20} = 1,40 g/ml) to 1 volume of hydrochloric acid (ϱ_{20} = 1,19 g/ml). Mix well, dilute with four volumes of water and mix again.

Use a freshly prepared acid mixture.

2.3 Apparatus

Ordinary laboratory apparatus, and in particular:

2.3.1 Grinder.

2.3.2 One-mark volumetric flask, of capacity 500 ml, complying with the requirements of ISO 1042, class A.

2.4 Test sample

Grind the laboratory sample until it passes through a sieve of aperture size 0,5 mm.

2.5 Procedure

2.5.1 Test portion

Weigh, to the nearest 1 mg, 2,5 g of the test sample and transfer it to a 400 ml beaker.

2.5.2 Extraction

Add 50 ml of the acid mixture (2.2). Cover the beaker with a clock-glass. Bring the mixture to boiling and simmer for 30 min. Add 100 ml of water, bring to boiling and simmer for a further 15 min. Cool to room temperature.

Transfer to the one-mark volumetric flask (2.3.2) and dilute to the mark with water. Mix carefully and filter the solution through a dry, folded medium-grade filter paper, free from phosphates. Discard the first two approximately 30 ml portions.

NOTE — The filtrate should be clear.

3 Method B: Sulfuric acid/nitric acid attack

3.1 Principle

Dissolution of the phosphates present in fertilizers or in mineral phosphates in a mixture of sulfuric and nitric acids.

3.2 Reagents

All reagents shall be of recognized analytical grade, and the water used shall be distilled water or demineralized water of equivalent purity.

3.2.1 Sulfuric acid (ϱ_{20} = 1,84 g/ml).

3.2.2 Nitric acid (ϱ_{20} = 1,40 g/ml).

3.3 Apparatus

Ordinary laboratory apparatus, and in particular:

3.3.1 Kjeldahl flask, of capacity at least 500 ml, or a **flask**, of capacity 250 ml, fitted with a reflux condenser.