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Rubber — Determination of magnesium content of field and concentrated natural rubber latices by titration (cyanide-free method)

Caoutchouc — Détermination par titrage de la teneur en magnésium du latex de plantation et du latex concentré de caoutchouc naturel (méthode sans cyanure)

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 3, *Raw material (including latex) for use in the rubber industry*.

Rubber — Determination of magnesium content of field and concentrated natural rubber latices by titration (cyanide-free method)

1 Scope

This International Standard specifies a cyanide-free titration method for the determination of the magnesium content in field and concentrated natural rubber latex.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 124, *Latex, rubber — Determination of total solids content*

ISO 648, *Laboratory glassware — Single-volume pipettes*

3 Terms and definitions

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

3.1
natural rubber latex concentrate
natural rubber latex from *Hevea brasiliensis* containing ammonia and/or other preservatives, which has been subjected to some process of concentration

3.2
field natural rubber latex
natural rubber latex with or without a preservative and prior to concentration or any other processing

Note 1 to entry: The preservative is added to maintain the original state of the latex as it came from the tree.

3.3
magnesium content
content of magnesium equivalent to alkaline-earth metals, mainly magnesium and calcium, present in all soluble forms that may be titrated with ethylenediaminetetraacetic acid in field or concentrated natural rubber latex

4 Apparatus

4.1 Burette, 50 cm^3 graduated.

4.2 Analytical balance, accurate to 0,1 mg.

4.3 Volumetric pipettes, of capacities 2 cm^3, 5 cm^3 and 10 cm^3 complying with the requirements of ISO 648, class A.

5 Reagents

Use reagents of recognized analytical quality. And, wherever water is specified, use distilled water or water of equivalent purity.

5.1 Magnesium sulfate solution.

Dissolve 1,232 4 g magnesium sulfate heptahydrate ($MgSO_4 \cdot 7H_2O$) in water and make up to 1 dm^3 in a flask. 1 cm^3 of this solution contains magnesium which is equivalent to 1 cm^3 of 0,005 mol/dm^3 EDTA.

5.2 EDTA solution, 0,005 mol/dm^3.

Dissolve approximately 1,86 g of sodium salt of ethylenediaminetetraacetic acid (EDTA) in water and make up to 1 dm^3. Standardize against the standard solution of magnesium sulfate specified in 5.1.

5.3 Masking agent solution.

Dissolve sufficient sodium hydrogen sulphide hydrate ($NaHS \cdot xH_2O$) to give at least 1,68 g sodium hydrogen sulfide (NaHS). Transfer into a 100 cm^3 volumetric flask and make up to volume with water. 1 cm^3 of this solution is equivalent to 1 cm^3 of 0,3 mol/dm^3 NaHS.

NOTE If the number of hydrate groups is not indicated (xH_2O), NaHS content may be calculated from the percentage of NaHS assay in the specification data. For example, if the percentage of NaHS assay equals 60,0 %, 2,80 g of $NaHS \cdot xH_2O$ is necessary to give 1,68 g of NaHS.

5.4 Eriochrome black T indicator.

Grind together, in a small pestle and mortar, 0,3 g of Eriochrome black T and 100 g of sodium or potassium chloride to give a homogeneous mixture.

5.5 Buffer solution of ammonium chloride/ammonium hydroxide.

Dissolve 67,5 g of ammonium chloride (NH_4Cl) in 250 cm^3 of deionized water, mix with 570 cm^3 of 25 % ammonium hydroxide (NH_4OH) and make up to 1 dm^3 with deionized water. The solution should have a pH of about 10,5.

5.6 Standardization of EDTA.

Pipette 10 cm^3 of the standard magnesium sulfate solution into a beaker. Add 200 cm^3 of water and adjust the pH to 10,3 by adding 6 cm^3 of the buffer solution. Add 0,1 g of Eriochrome black T indicator and titrate with EDTA solution.

5.7 Calcium hydroxide powder.

6 Method A — Determination of magnesium content of field latex

6.1 Principle

This method determines the soluble concentration of divalent alkaline earth ions present in the latex after the dilution. The results are expressed as magnesium content on the assumption that other divalent alkaline earth ions, such as calcium, are only present at the micromolar concentration level.

The latex is diluted with water. The soluble magnesium content in the latex is determined by titration with the sodium salt of EDTA in the presence of NH_4Cl/NH_4OH buffer using sulfide releasing agent as masking agent and Eriochrome Black T as indicator.

The magnesium content is expressed as a percentage of the total solids content of latex.