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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION

R 1656

RAW NATURAL RUBBER AND NATURAL RUBBER LATEX

DETERMINATION OF NITROGEN

1st EDITION

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BRIEF HISTORY

The ISO Recommendation R 1656, *Raw natural rubber and natural rubber latex – Determination of nitrogen*, was drawn up by Technical Committee ISO/TC 45, *Rubber*, the Secretariat of which is held by the British Standards Institution (BSI).

Work on this question led to the adoption of Draft ISO Recommendation No. 1656, which was circulated to all the ISO Member Bodies for enquiry in July 1968. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies :

Australia	Hungary	Sweden
Austria	India	Switzerland
Brazil	Iran	Thailand
Canada	Israel	Turkey
Ceylon	Italy	U.A.R.
Colombia	Korea, Rep. of	United Kingdom
Czechoslovakia	Netherlands	U.S.A.
France	New Zealand	U.S.S.R.
Germany	Poland	
Greece	Spain	

No Member Body opposed the approval of the Draft.

This Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided to accept it as an ISO RECOMMENDATION.

RAW NATURAL RUBBER AND NATURAL RUBBER LATEX

DETERMINATION OF NITROGEN

1. SCOPE

This ISO Recommendation describes a macro method and a semi-micro method for the determination of nitrogen in raw natural rubber and in natural rubber latex using variants of the Kjeldahl process.

NOTE. – The determination of nitrogen in natural rubber is usually carried out in order to arrive at an estimate of the protein content. Minor amounts of non-proteinous nitrogen-containing constituents are also present, however, and in the dry solids prepared from natural rubber latex these materials can make a substantial contribution to the total nitrogen content.

2. PRINCIPLE OF METHODS

Digestion of a known mass of the sample with a mixture of sulphuric acid, potassium sulphate, and catalytic amounts of copper sulphate and selenium or sodium selenate, thereby converting nitrogen compounds into ammonium hydrogen sulphate from which the ammonia is distilled after making the mixture alkaline.

Absorption of the distilled ammonia either

- in standard sulphuric acid followed by titration of the excess acid with a standard base, or
- in boric acid solution followed by titration with standard acid.

3. MACRO METHOD

3.1 Reagents

All reagents should be of recognized analytical quality and distilled water should be used where water is specified.

3.1.1 Zinc, granulated.

3.1.2 Catalyst mixture or catalyst solution.

(a) Catalyst mixture. Prepare a finely divided intimate mixture of :

- 30 parts by mass of anhydrous potassium sulphate;
- 4 parts by mass of copper sulphate pentahydrate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$);
- 1 part by mass of selenium powder, or 2 parts by mass of sodium selenate.

(b) Catalyst solution. Dissolve, with heating :

- 110 g of anhydrous potassium sulphate;
 - 14.7 g of copper sulphate pentahydrate;
 - 3.7 g of selenium, or 7.49 g of sodium selenate;
- in 600 ml of sulphuric acid (ρ 1.84 g/ml).

3.1.3 Sulphuric acid, ρ 1.84 g/ml.

3.1.4 Sulphuric acid solution 0.1 N.