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METHODS OF TEST FOR RUBBER LATEX

PART VI DETERMINATION OF *p*H

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Indian Standard

METHODS OF TEST FOR RUBBER LATEX

PART VI DETERMINATION OF *p*H

0. FOREWORD

0.1 This Indian Standard (Part VI) was adopted by the Indian Standards Institution on 10 November 1982, after the draft finalized by the Rubber Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 Test methods for natural rubber latex were covered in IS : 3708 (Part I)-1966* and IS : 3708 (Part II)-1968†, and for styrene-butadiene rubber (SBR) latices, in IS : 4511 (Part I)-1967‡. Some of the test methods covered in the above standards are common. Need has also been felt to align these test methods with the corresponding ISO standards. It has, therefore, been decided to unify and publish a separate series of these methods of test which are applicable to all types of latices-natural as well as synthetic. This standard forms a part of this series.

0.3 The method for determination of *p*H was prescribed in **11** of IS : 3708 (Part I)-1966* (for natural rubber latex) and **4** of IS : 4511 (Part I)-1967‡ (for SBR latices). With the publication of this standard **11** of IS : 3708 (Part I)-1966* and **4** of IS : 4511 (Part I)-1967‡ stand superseded.

0.4 This standard is based on ISO 976-1977 'Rubber latices—Determination of *p*H' published by the International Organization for Standardization (ISO). In respect of the requirements for standardization of *p*H meter, however, it specifies disodium hydrogen phosphate solution as an alternative to potassium hydrogen phthalate solution, and a temperature of 27 ± 2°C in place of 23 ± 1°C.

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*Methods of test for natural rubber latex: Part I Dry rubber content, total solids, coagulum content, viscosity, sludge content, density, total alkalinity KOH number, mechanical stability, volatile fatty acid number, *p*H, total nitrogen, total copper, total iron, total manganese and total ash.

†Methods of test for natural rubber latex: Part II Determination of boric acid and magnesium in latex.

‡Methods of test for styrene-butadiene rubber (SBR) latices: Part I Determination of dry polymer, total solids, coagulum, *p*H, surface tension, density viscosity, residual styrene, bound styrene and soap content.

0.5 In reporting the result of a test or analysis made in accordance with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard prescribes a method for determination of *p*H of natural rubber latex which contains preservative agents and which has been submitted to some type of concentration process, and also for the determination of *p*H of synthetic rubber latices.

1.1.1 The procedure is not necessarily suitable for latices from natural sources other than *Hevea brasiliensis* or for compounded latex, vulcanized latex or artificial dispersions of rubber.

1.2 The accuracy of the method decreases at *p*H values above 11.

2. REAGENTS

2.1 Disodium Hydrogen Phosphate Solution — 0·01 M. Dissolve 1·780 g of disodium hydrogen phosphate dihydrate ($Na_2HPO_4.2H_2O$) in 100 ml of 0·1 M carbonate-free solution of sodium hydroxide, dilute to 1 litre with carbon dioxide-free distilled water in a one-mark graduated flask. The solution shall be stored in wax-coated glass containers or polyethylene containers fitted with soda-lime carbon dioxide traps. The *p*H of this solution is 11·6 at 27°C.

2.2 Borax Solution — 0·01 M. Dissolve 3·814 g of sodium tetraborate decahydrate ($Na_2B_4O_7.10H_2O$) in carbon dioxide-free distilled water and dilute to 1 litre in a volumetric flask. The solution shall be stored in chemically resistant glass or polyethylene containers, fitted with soda-lime carbon dioxide trape. It shall be replaced after one month. The *p*H of this solution is 9·1 at 27°C.

2.3 Potassium Hydrogen Phthalate Solution — 0·05 M. Dissolve 10·21 g of potassium hydrogen phthalate ($HOOC.C_6H_4COOK$) in carbon dioxide-free distilled in water and dilute to 1 litre in a volumetric flask. The solution shall be stored in chemically resistant glass or polyethylene containers. It shall be replaced after one month. The *p*H of this solution is 3·9 at 27°C.

3. APPARATUS

3.1 *p*H-Meter — Equipped with glass electrode and saturated calomel cell, and capable of being read to 0·02 unit. The glass electrode shall be of a type suitable for use in solutions of *p*H up to 13.

*Rules for rounding off numerical values (*revised*).

4. PROCEDURE

4.1 Standardization of *p*H Meter — Switch on the *p*H meter and allow it to warm up according to the manufacturer's instructions. Wash the electrodes with water and then with 0·01 M borax solution. Immerse the electrodes in 0·01 M borax solution and bring the assembly to a temperature of 27 ± 2°C. Adjust the instrument to read 9·1. Check the adjustment on a separate portion of the borax solution. Successive readings shall agree within 0·05 *p*H unit. Wash the electrodes with distilled water and then with disodium hydrogen phosphate solution or potassium hydrogen phthalate solution. Measure the *p*H of this solution at an equilibrium temperature of 27 ± 2°C. The instrument is considered to be operating satisfactorily if the *p*H value obtained from the *p*H of the disodium hydrogen phosphate solution or potassium hydrogen phthalate solution is 11·6 ± 0·5 or 3·9 ± 0·5 respectively.

NOTE — Due to differences in individual electrode response, it may not be possible to standardize the *p*H meter as above. In this case, the *p*H meter shall be standardized by means of a single solution of recognized *p*H value, which value is approximately the same as that of the latex to be tested. If the *p*H meter has a slope control, it shall be standardized according to the manufacturer's introductions using of borax solution (2·2), and disodium hydrogen phosphate solution (2·1) or potassium hydrogen phthalate solution (2·3).

4.2 Determination of *p*H of Latex -- Wash the electrodes with distilled water and wipe dry with soft absorbent paper. Immerse the electrodes in the latex, bring the assembly to a equilibrium temperature of 27 ± 2°C and measure the *p*H value. Duplicate determinations should agree within 0·1 unit. The *p*H of the latex shall be reported to the nearest 0·1 units.

4.2.1 When not in use, the glass electrodes shall be kept in distilled water and the calomel electrode in saturated potassium chloride solution. If a series of determination is to be made, the *p*H meter shall be checked, using 0·01 M borax solution, at 30-minute intervals, or more frequently depending on the change found at each successive check.

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