INTERNATIONAL STANDARD 2114

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Plastics — Unsaturated polyester resins — Determination of acid value

Matières plastiques — Résines de polyesters non saturés — Détermination de l'indice d'acide

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FOREWORD

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International Standard ISO 2114 was drawn up by Technical Committee ISO/TC 61, *Plastics.*

It has been approved by the Member Bodies of the following countries:

Australia	Greece	Portugal
Austria	Hungary	Romania
Belgium	India	South Africa, Rep. of
Canada	Israel	Spain
Chile	Japan	Sweden
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France	New Zealand	U.S.S.R.
Germany	Poland	

No Member Body expressed disapproval of the document.

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Plastics — Unsaturated polyester resins — Determination of acid value

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method of determining the acid value of unsaturated polyester resins. In some cases, notably when free anhydrides are present, a somewhat lower than theoretical acid value is found, due to the formation of acid esters which precipitate and are, therefore, not determined.

2 DEFINITION

acid value : The number of milligrams of potassium hydroxide (KOH) required to neutralize 1 g of the test product under the test conditions.

3 PRINCIPLE

A weighed quantity of resin is dissolved in a mixture of solvents and the resin solution is titrated with a standardized ethanolic solution of potassium hydroxide, using a suitable indicator.

The number of milligrams of potassium hydroxide used to neutralize 1 g of resin is calculated.

4 REAGENTS

4.1 Solvent mixture, composed of 2 parts of toluene and 1 part of absolute ethanol.

4.2 Thymol blue, 0,1 % indicator solution in absolute ethanol.

4.3 Potassium hydroxide, 0,1 N standard volumetric solution in absolute ethanol.

The solution must be anhydrous and as free from carbon dioxide as possible.

If required :

4.4 Acetone, containing less than 0,1 % of water.

5 APPARATUS

5.1 Conical flask, capacity 250 ml, with a large neck.

5.2 Burette, capacity 25 ml, graduated in 0,05 ml divisions.

5.3 Magnetic stirrer.

5.4 Source of nitrogen gas.

5.5 Pipette, capacity 50 ml.

6 PROCEDURE

Weigh, to the nearest 1 mg, 0,5 to 3 g of the resin into the flask (5.1), the quantity depending on the expected acid value.

Add 50 ml of the solvent mixture (4.1), using the pipette.

Shake until the resin has completely dissolved, warming if necessary on a water bath with a condenser on the flask. If the solubility is poor, or if solution is incomplete in about 5 min, prepare another solution by dissolving another test portion in a mixture of 50 ml of the solvent mixture (4.1) and 25 ml of acetone (4.4). Record this change in procedure in the test report.

Cool the solution to room temperature.

Add 5 drops of thymol blue solution (4.2). Place the flask on the magnetic stirrer and bubble into the solution a stream of nitrogen.

Titrate with the potassium hydroxide solution (4.3) from the burette (5.2) to the point where the colour remains blue for 20 to 30 s. Record the volume, V_1, of KOH solution (4.3) used, in millilitres.

Carry out a blank determination using 50 ml of the solvent mixture (4.1) (or 50 ml of the solvent mixture (4.1) and 25 ml of acetone (4.4) as described above) and titrate to obtain the same blue coloration as obtained when the resin was present. Record the volume, V_2, of KOH solution (4.3) used, in millilitres.