

TMT 15[®] - ANALYTICAL PROCEDURE

Info 3 E - Determination of the content, density and pH-value

The analysis should be performed on a clear and, if necessary, filtered sample.

1. DETERMINATION OF CONTENT

The trimercaptotriazine tri-sodium-salt (TMT-Na₃) is determined by potentiometric titration with 0.5 Mole/l sulphuric acid. 5 ml TMT 15[®] are added to a 150 ml beaker using a pipette, diluted with about 100 ml deionised water and titrated with 0.5 mole/l sulphuric acid.

The trend of the pH is measured during the titration using a pH electrode (e. g. Schott, H 61) and plotted by a chart recorder. A titration curve results with three points of inflexion, which correspond to the three necessary acid equivalents to transfer the TMT-Na₃ into the so called H-form (Diagram on page 3)



For the calculation of the content, only the first point of inflexion (at pH 10.1) and third point of inflexion (at pH 4.0) are used, since these enable the best calculation.

CALCULATION

$$\frac{(V_3 - V_1) \times 243,22 \times 0,01}{D} = \% \text{TMT-Na}_3$$

- V₃ = ml 0.5 mol/l H₂SO₄ at 3rd point of inflexion (pH 4.0)
- V₁ = ml 0.5 mol/l H₂SO₄ at 1st point of inflexion (pH 10.1)
- D = Density (approx. 1.12 g/ml für TMT 15[®])
- 243.22 = molecular weight of TMT-Na₃ (g/mole)
- 0.01 = calculation factor for %

EXAMPLE FOR CALCULATION

$$\frac{(10,3 - 3,35) \times 243,22 \times 0,01}{1,12} = 15,1 \% \text{TMT-Na}_3$$

Diagram: Potentiometric Titration of TMT 15[®] with Sulfuric Acid



2. DETERMINATION OF DENSITY

The density of TMT 15[®] is measured in a 250 ml graduated cylinder using an aerometer. It is approx. 1.12 g/ml.

3. pH-VALUE

The pH of TMT 15[®] is measured using a pH-meter with a combined electrode system. The electrode is calibrated with buffer solutions (e.g. pH 7 and pH 10). The pH-value of TMT 15[®] is approx. 12.3.

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