

Ti Application Note No. T- 37

Title: Nitrogen content of nitrocellulose

Summary: Determination of the nitrogen content of nitrocellulose by potentiometric titration with Fe(II) using a combined Pt electrode.

Sample: Nitrocellulose film

Sample Preparation: Weigh exactly ca. 150 mg sample (precision 0.1 mg) into a 100 mL volumetric flask and add ca. 80 mL conc. H₂SO₄. Place into an ice-cooled ultrasonic bath, dissolve the sample and fill the flask to the mark with conc. H₂SO₄. Store this solution at 5 °C.

Instruments and Accessories: 702, 716, 736 or 751 Titrino or 726 Titroprocessor, 6.0420.100 combined Pt electrode, 6.1418.220 titration vessel with thermostatic jacket, 6.1103.000 Pt 100 temperature sensor, cryostat

Analysis: Pipette 20.0 mL of the prepared sample solution into the titration vessel, cool down to 5 °C and titrate with c[(NH₄)₂Fe(SO₄)₂] = 0.12 mol/L.

Calculation:
$$\% N = EP1 * C01 * C02 * C03 / (C00 * C04 * C05)$$

EP1 = titrant consumption in mL
C00 = 20.0 (volume of the sample solution used for the titration in mL)
C01 = 0.12 (concentration of the titrant in mol/L)
C02 = 14.01 (M(N) in g/mol)
C03 = 100 (conversion factor for %)
C04 = 2 (stoichiometric factor: 2 Fe²⁺ react with 1 N)
C05 = ca. 1.5 (mass concentration of the sample solution in g/L nitrocellulose)

Remarks: Before starting the titration make sure that the temperature of the sample solution is below 10 °C.

Result:
AVG(4) = 12.03 +/- 0.05 % N