

Ti Application Note No. T- 16

Title: Non-ionic surfactants in compact washing powders

Summary: Determination of non-ionic surfactants in compact washing powders by potentiometric titration with sodium tetraphenylborate using the NIO surfactant electrode.

Sample: Two different washing powders

Sample Preparation: Weigh exactly 10.0 g sample into a 400 mL beaker. Add 200 mL hot, dist. water and heat the solution with stirring to ca. 95 °C. Allow the solution to cool, rinse it into a 1000 mL volumetric flask with dist. water and fill to the mark.

Instruments and Accessories: 702, 716 or 736 Titrino or 726 Titroprocessor, 6.0507.010 NIO surfactant electrode and 6.0726.100 reference electrode (bridge electrolyte $c(\text{NaCl}) = 3 \text{ mol/L}$)

Analysis: Pipette 25.0 mL of the prepared sample solution (corresponds to 0.25 g of the original sample) and 10 mL $c(\text{BaCl}_2) = 0.1 \text{ mol/L}$ into a beaker. Add ca. 70 mL dist. water and titrate with sodium tetraphenylborate $c(\text{STPB}) = 0.01 \text{ mol/L}$.

Calculation:

a) Content of NIO surfactants in mmol/g

$$\text{mmol/g NIO surfactants} = EP1 * C01 / C00$$

EP1 = titrant consumption in mL
C00 = 0.25 (g of original sample contained in the sample volume used for the titration)
C01 = 0.01 (concentration of the titrant in mol/L)

b) Content of NIO surfactants in %

Determination of the calibration factor:

Weigh ca. 0.2 ... 0.3 g of the standard NIO surfactant into a beaker and dissolve in 10 mL $c(\text{BaCl}_2) = 0.1 \text{ mol/L}$. Add ca. 70 mL dist. water and titrate with $c(\text{STPB}) = 0.01 \text{ mol/L}$.

Calculation: $f \text{ (mg/mL)} = E * 1000 / EP1$

EP1 = titrant consumption in mL

f = calibration factor in mg/mL

E = sample weight in g (calculated as 100 % NIO surfactant)

Content determination:

% NIO surfactants = $EP1 * f * C01 / C00$

C00 = 0.25 (g of original sample contained in the sample volume used for the titration)

C01 = 0.1 (conversion factor for %)

Remarks:

Results:

Sample A: AVG(3) = 0.1642 +/- 0.0054 mmol/g NIO surfactants

Sample B: AVG(3) = 0.0740 +/- 0.0015 mmol/g NIO surfactants