

Ti Application Note No. T- 50

Title: Non-ionic surfactant nonylphenol ethoxylate (8 EO)

Summary: Determination of the non-ionic surfactant nonylphenol ethoxylate by potentiometric titration with sodium tetraphenylborate using the NIO Surfactant Electrode.

Sample: Basic product: nonylphenol ethoxylate (8 EO)

Sample Preparation: Weigh ca. 3 g sample (precision 0.1 mg) into a 1000 mL volumetric flask. Dissolve the sample in dist. water, fill the flask to the mark and mix with a magnetic stirrer.

Instruments and Accessories: 702, 716, 736 or 751 Titrino or 726 Titroprocessor, 727 Titration Stand, 722 Propeller Rod Stirrer, 6.0507.010 NIO Surfactant Electrode

Analysis: Pipette 10.0 mL of the prepared sample solution into a beaker, add 10 mL $c(\text{BaCl}_2) = 0.1 \text{ mol/L}$ and ca. 80 mL dist. water and titrate with sodium tetraphenylborate $c(\text{STPB}) = 0.01 \text{ mol/L}$.

Calculation: As the precipitation of non-ionic surfactants with STPB is not stoichiometric, so-called calibration factors have to be determined:
mL STPB / g NIO (f1) or
mg NIO / mL STPB (f2)

$$f1: \text{ mL STPB / g NIO} = EP1 / C00$$
$$f2: \text{ mg NIO / mL STPB} = C00 * C01 / EP1$$

EP1 = titrant consumption in mL
C00 = ca. 0.03 (g of original sample contained in the sample volume used for the titration)
C01 = 1000 (conversion factor)

Remarks: For the preparation of the BaCl_2 and STPB solution see Application Bulletin No. 230.

Results:

f1: $\text{AVG}(4) = 276.75 \pm 4.5 \text{ mL STPB / g NIO}$

f2: $\text{AVG}(4) = 3.613 \pm 0.06 \text{ mg NIO / mL STPB}$