



Working instruction for student

Determination of 9-ACA (9-anthracene carboxylic acid)

1. Task definition

You are a laboratory technician in a company which, among other businesses, produce fine chemicals. You are responsible for the output quality control of the final products. Your today's task is to determine the content of 9-ACA in the final product by automatic potentiometric titration. You are provided with the relevant equipment. You are supposed to perform the procedure by following working instructions and specify the content of 9-ACA in the sample in mass%, then to compare your findings with the technical requirement for the final product.

2. Measuring devices and chemicals

Titration T50 by Mettler with pH electrode DG 111-SC, burette 20 mL

Analytical scales Mettler XS 205

pH-meter

Magnetic stirrer

laboratory glass ware

solution of NaOH, 50 mass %,

ethanol denatur.

potassium hydrogenphthalate p.a.

3. Working steps

- preparation of NaOH 0,1 mol/L by dilution of 50% solution in 2 L volumetric flask
- preparation of 2 L of ethanol-water solution mixed in volume ratio 4:1
- building the apparatus
- filling the burette with titrant solution (0,1 M NaOH)

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- determination of blank sample value: take 200 mL of ethanolic solution and titrate it with 0,1 M NaOH, divide the achieved volume consumption by 4 to get blank value (corresponding to volume used for dissolving 9-ACA prior to its titration)
- determination of titrant solution's concentration: weigh 0,27g potassium hydrogenphthalate (analytical scales), add 50 mL of water and dissolve the substance, perform titration with 0,1 M NaOH solution
- determination of 9-ACA: by using analytical scales weigh 0,2 - 0,25 g of 9-ACA straight into titration flask, dissolve the sample in 50 mL of ethanolic solution and titrate it with 0,1 M NaOH

4. Data treatment

- all data are put in the program (blank value, mass of potassium hydrogenphthalate, mass of 9-ACA) prior to each particular titration
- the program proceeds the data and evaluate the analyses
- the content of 9-ACA is calculated in mass %
- the achieved result is compared with the technical requirements for the final product, the content of 9-ACA in the product must not be lower than 98 mass %.

5. Disposal

All solutions may be washed down the drain. Do not return unused solutions to the stock solution containers.