

Working instructions for student

Estimation of pH

1. Task definition

You are a laboratory technician in a chemical plant that produces organic specialities. You are responsible for both process and output control of the production. Your today's task is to control the process of Akardin (N, N - diphenyl - N – methylurea) production by pH measurement of its aqueous solution. To meet the technical requirements, the pH value of the substance leach should be in range from 6.5 to 7.5. To perform the measurement you are provided with pH-meter together with pH-measuring cell. pH-meter has to be calibrated prior its use and the accuracy of the measurement has to be checked by a control sample, pH value of which is close to the expected value of the sample.

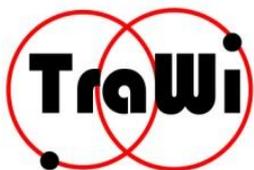
2. Measuring devices and chemicals

titration unit/pH-meter Titrino 716, pH-measuring cell
buffers
sample of Akardin (N,N-diphenyl-N–methylurea)
magnetic stirrer
filtration apparatus (or centrifuge)
common laboratory glass ware

3. Working steps

- **Preparation of the sample solution:**

Weigh 10.0 g of a dried sample, add 250 mL of reboiled distilled water, keep mixing the solution with stirring rod for 1 minute, then allow the solution to cool either in



fridge or in a cold water bath. Filter the suspension and measure pH value of the supernatant.

- **Setting-up of pH-meter:**

Switch the pH-meter ON, press button **User Meth** to select a method to be used.

- **Calibration of pH-meter:**

Pour each buffer solution into a beaker, insert mixing body. By following user manual perform 3-point calibration. Put each buffer on the magnetic stirrer, immerse the electrode into the buffer solution and start calibrating. After each measurement rinse the electrode with distilled water and wipe it with cellulose wadding. Make a record about the calibration by putting down the value of electrode asymmetry and the slope of the calibration curve into the measurement protocol.

- **Measurement of a control sample**

To check accuracy carry out measurement of a control sample, pH of which is 6.87. The found value mustn't differ from this given value by more than 0,1 pH unit. Make a record about the result of the control measurement into the protocol.

- **Measurement of the substance leach**

Pour the substance leach in a beaker and measure its pH value. Solution is not mixing during the measurement in this case.

- **Evaluation of the sample**

Compare the found value with the technical requirement for the product.

4. Disposal

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