Short Description of pH uncertainty calculation application

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http://www.ut.ee/katsekoda/ph/

1 Introduction

This application can be used to calculate the uncertainty of pH value measured using routine equipment with two-point calibration (also called bracketing calibration). The calculation takes into account all the parameters of the measurement system and measurement procedure that are visible on the sheet.

The calculation is fully automatic. In the simplest case, all the user needs to do is to enter the pH value and the uncertainty of the pH value will be calculated automatically by the application. By default, the uncertainty is calculated at k=2 level (that means roughly 95% confidence level).

2 Changing the Parameters of the Measuring system

The parameters of the measurement system can be changed by the user so that they take into account the actual equipment and measurement procedure used (temperature, calibration buffer solutions, etc).

Most of the parameter values are accompanied by: "☑ AUTO ". This means that the calculation file by default uses certain "normal" (manufacturer's default) values that are usual for the routine analysis pH meters that are currently on the market. If the check-box AUTO is cleared, then the cell containing the value of the corresponding parameter turns yellow and the value of the parameter can be changed.

3 Changing the Calibration Buffer Solutions

Certain preset buffers are included in the application. When clicking on either of the arrow buttons at the buffer lines, a drop-down menu appears. If the buffers used by the user can be found among the ones in the menu, they can be selected. If the user has used different buffers then he/she can select "other" and enter the pH value manually.

The preset buffers have the advantage that the temperature dependencies and buffer uncertainties (accuracies) are included in the file and are changed automatically (if AUTO is checked) every time the parameters are changed. In the case of the "other" buffers the system assigns certain default values but it is better if the user substitutes these for the actual ones.

4 Thermosensor

In most modern pH measurement systems thermosensor is used to automatically compensate for differences in calibration and measurement temperature and also the temperature dependence of the pH values of the buffer solutions. This feature is fully incorporated into the present application. The automatic temperature compensation is functional if "Yes" is near the "Thermosensor used?" field. If the user wishes to turn this feature off, then "No" has to be ticked.