Influence of Temperature on Performance of Chemical Sensors

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The paper presents the temperature characteristics of three types of chemical sensors: ion-selective electrode, ion-sensitive field effect transistor, and optical sensor. Various pH sensors were tested in pH buffers within the temperature range 5–35°C. The measuring set-up consisted of a thermoregulator, a signal-conditioning unit designed to match the specific requirements of the sensor, a data acquisition card, and a personal computer. The system was controlled by a special application software developed under the LabView environment.


Chemical analysis often requires the determination of a composition of a sample in real-time, e.g. the on-line monitoring of various chemical processes. The traditional analytical techniques can be used for such purposes but the cost of the analysis would be quite high and the analysis is usually time-consuming. Another approach to the multiparameter measurements is based on the use of the chemical sensors selective to the analytes that are of interest. An analytical system utilising various types of chemical sensors (electrochemical, optical etc.) would be considered as reliable if the results are verified by independent methods.