

IR-Spectroscopy and Multivariate Data Analysis in Point of Care Testing

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In medicine, an early decision on the right course of treatment can make the difference between life and death. Therefore, the rapid availability of test results can be crucial. Devices that facilitate medical testing at or near the point of patient care (Point-of-care Testing, POCT) significantly reduce the time between drawing the sample and receiving the test results. Hence, this will become increasingly relevant in modern day diagnosis and therapy.

At this point, multiparameter POCT is available for only few parameters since every single analyte requires a highly specific indicator substance. Infrared spectroscopy is a very promising technology for new POC devices since it enables a marker free, parallel analysis of various medical parameters in one unaltered sample. In combination with multivariate statistical modeling, a sufficient quantitative prediction of the investigated substances can be achieved. Another challenge in IR-spectroscopy based POCT is the size and usability of the device. Preferably POC devices are small, mobile, and easy to use. However, most high-end FTIR- spectrometers do not meet these requirements. Our approach is to use modern micro-spectrometers to exploit the advantages of mid-IR-spectroscopy with a new compact detection system. Here results of our initial study on the determination of selected high-content blood contents i.e. albumin, total protein, and ethanol, will be shown.