

Session 1 - NIR Spectroscopy / Imaging (Co-chairs: Huck/Siesler)

01-01: Hand-held vibrational spectrometers: State-of-the art instrumentation and novel applications

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Miniaturization of vibrational spectrometers has started more than two decades ago, but only within the last decade real hand-held Raman, mid-infrared (MIR) and near-infrared (NIR) scanning spectrometers have become commercially available and have been utilized for a broad range of analytical applications [1-7]. In actual fact, marketing companies predict this segment of instrumentation a significant growth rate within the next few years. This increase will be primarily based on a wider adoption of spectrometers for quality control by in-the-field testing and on-site measurements and by expansion to a new user community.

In view of the higher price level of miniaturized Raman and MIR instruments (>10 K US\$) compared to NIR systems (~1 K US\$) only the last mentioned spectrometers can be taken into consideration for private use in the near future, whereas hand-held Raman and MIR spectrometers will be restricted to industrial, military and homeland security applications and public use by first responders, customs or scientific institutions. Thus, based on high-volume manufacturability and further reduction of costs, numerous companies target with NIR instruments a non-expert user community for consumer applications. Especially from this last-mentioned development a tremendous potential for everyday life can be expected ranging from food testing to detection of fraud and adulteration in a broad area of materials. The presentation will shortly describe instrumental features of novel hand-held Raman, MIR and NIR spectrometers and discuss selected qualitative and quantitative case studies.

References

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