

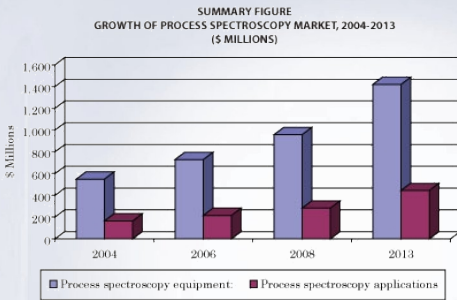
Improved Detector Head for Spectrometric Devices

licensing opportunity:

Invention

An optical detector head for spectrometric measurements of NIR-remission spectra was modified to minimize direct reflexion of optical elements, which in general acts as temperature dependent disturbing signal. The inventive method reduces effective direct reflexion to values down to estimated less than 0.1%. The reflex reduction works as well for coated as uncoated lenses, as well for UV as for IR, independent of temperature changes.

Market



Process spectroscopy equipment:

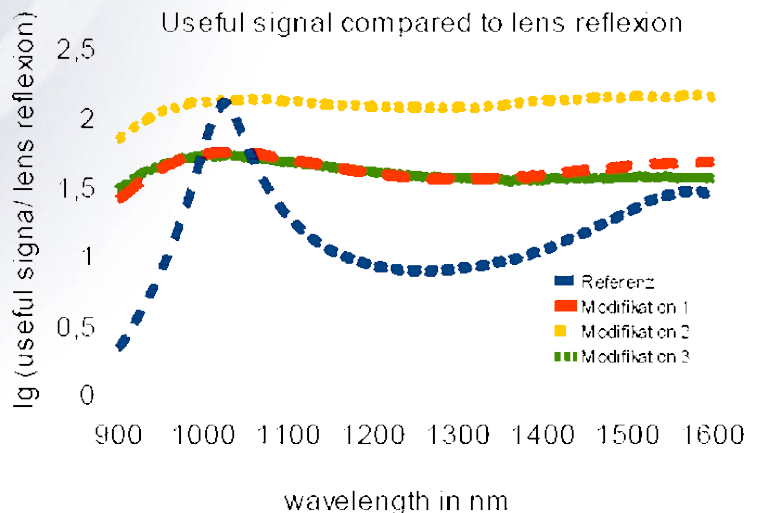
- Global market ca. \$950 million
- AGR > 5%, driven by strong demands of Good Manufacturing Practice (GMP) and the Process Analytical Technology (PAT) initiative of the FDA and its analog of EMEA
- Exemplary fields: medical, food and beverage, agriculture, chemical industry, humidity detection in production processes, quality management

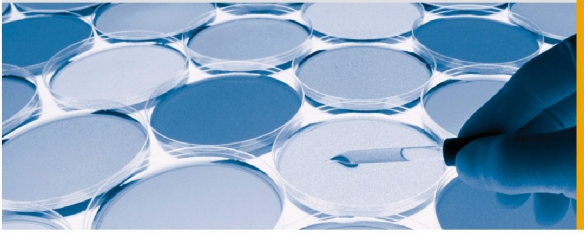
Proof of Concept

Comparison of different lens designs, near to in-use conditions, NIR-range

- Reference: standard coated lens ($R_{\max} < 1.5\%$, 1000 nm to 1550 nm,)
- Inventive modifications 1 to 3 of reference lens
- Illumination conditions adapted to reference lens
- Useful signal: reflexion of TiO_2 in measurement distance

Comparison of Lens Designs





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Details

- **Context:** invention was made in context of humidity measurement by means of spectrometric sensing and chemometric evaluation
- **Main problem to be solved:** significant residual influence of detector head temperature changes on measured signals after applying all possible corrections ($T_{\max} > 60^{\circ}\text{C}$, large ΔT)
- **Additional advantages:**
 - better signal-to-noise ratio in broad spectral range
 - easy to implement
 - useful for uncoated lenses
 - low effect on general optics specification
 - applicable to all wavelength from UV to IR
- **To be tested:** effect to uncoated lenses at wavelengths above 1700 nm, as there do not exist standard coated lenses

Comparison to State of the Art

- Larger temperature range, in which detector head can be used
- Better sensitivity respective higher S/N-ratio
- Good value solution, especially in contrast to situations where otherwise expensive customized coatings are needed
- No aging effects in contrast to quality loss of coatings over time

German Patent 102008009599 granted.

We are looking for a licence partner.