

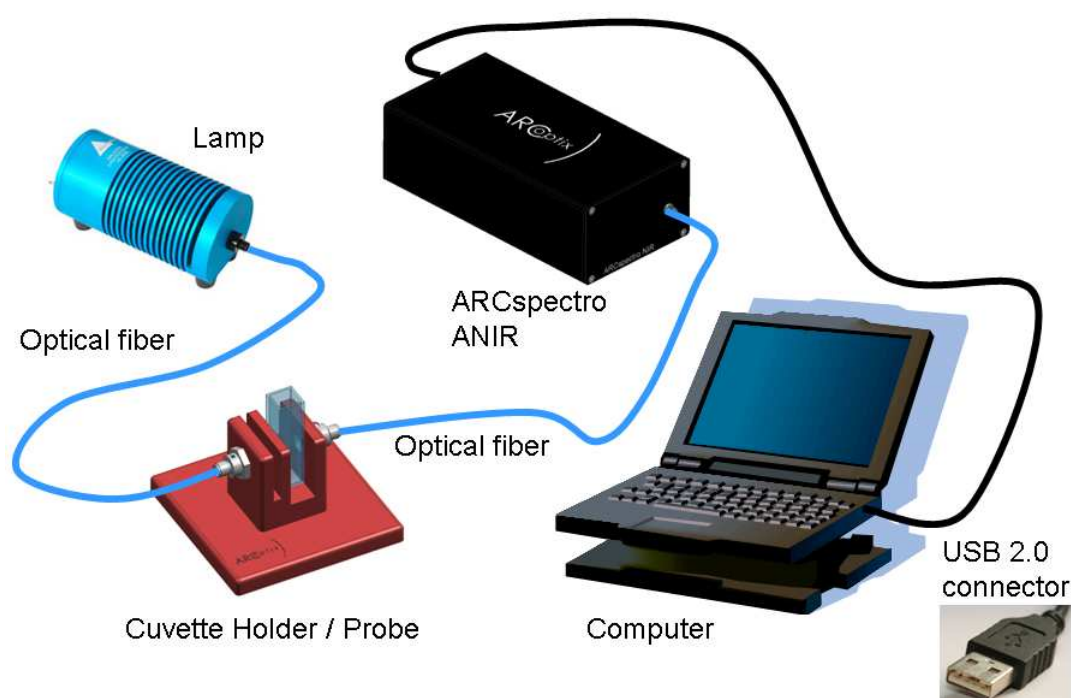
ARCSPECTRO NIR: MEASUREMENT EXAMPLES

This document illustrates some examples of spectra measured with an **ARCspectro ANIR 0.9-2.6** Fourier-transform spectrometer. Transmissions as well as diffuse-reflection spectral measurements are shown.

TRANSMISSION SPECTRA

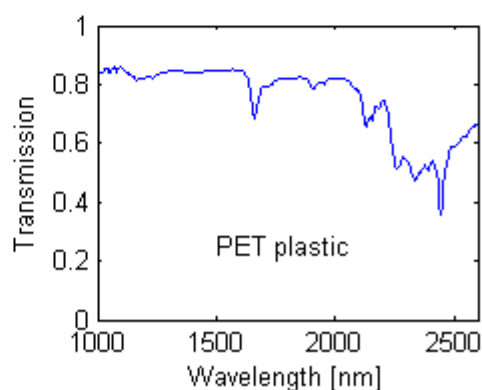
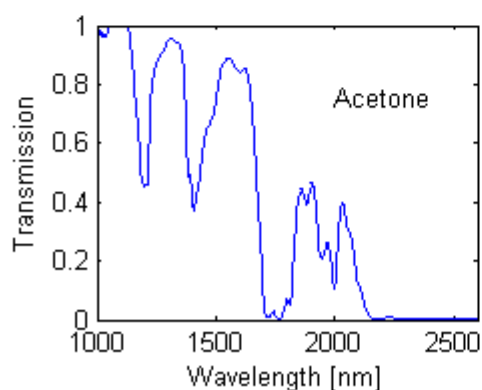
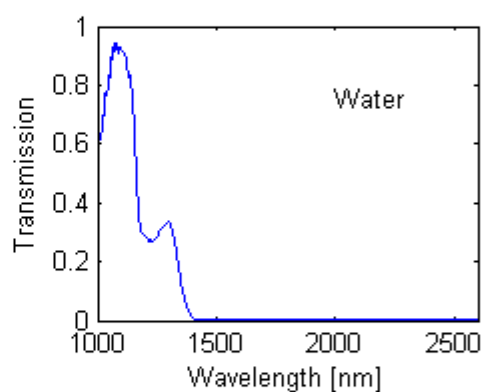
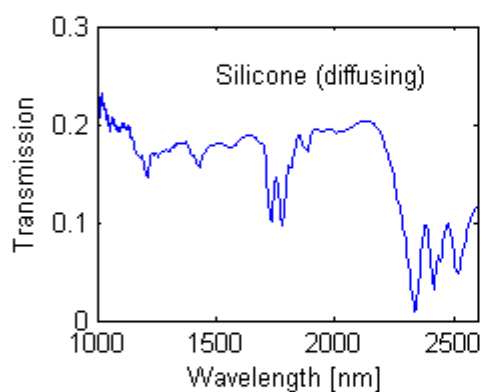
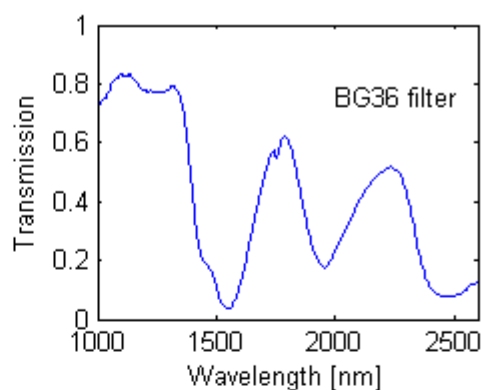
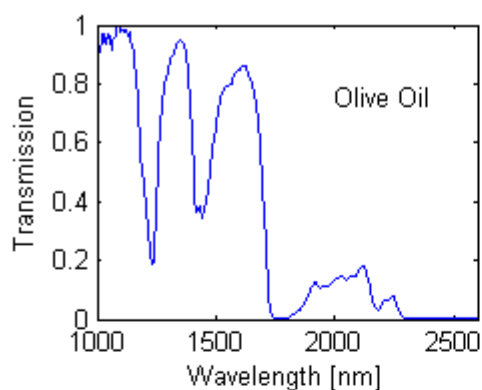
SET-UP

Transmission measurements were performed using a 20W tungsten halogen light source (HL-2000 HP), a sample holder and 600 microns VIS-NIR optical fibers. The USB-powered spectrometer is connected to a personal computer.



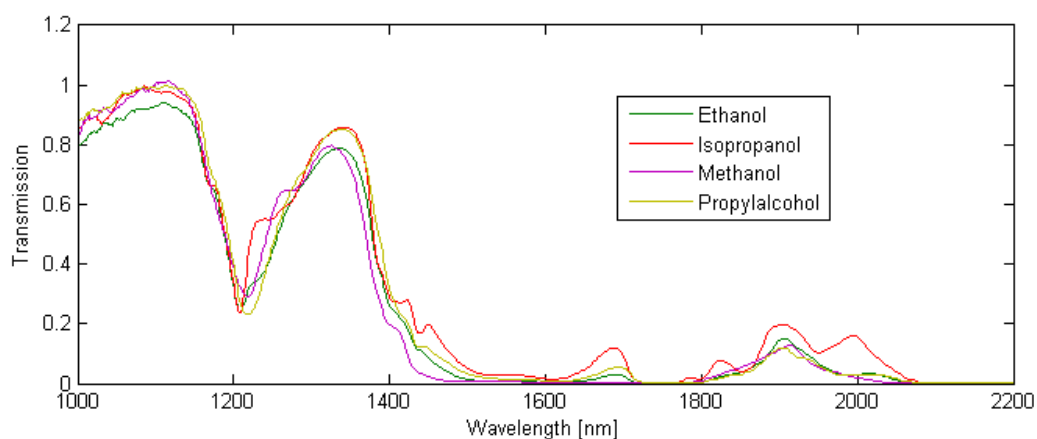
MISCELLANEOUS

Below are some examples of transmission spectra measured on solids and liquids with the ARCspectro ANIR 0.9-2.6. Liquids were measured in a 1cm-thick quartz cuvette.



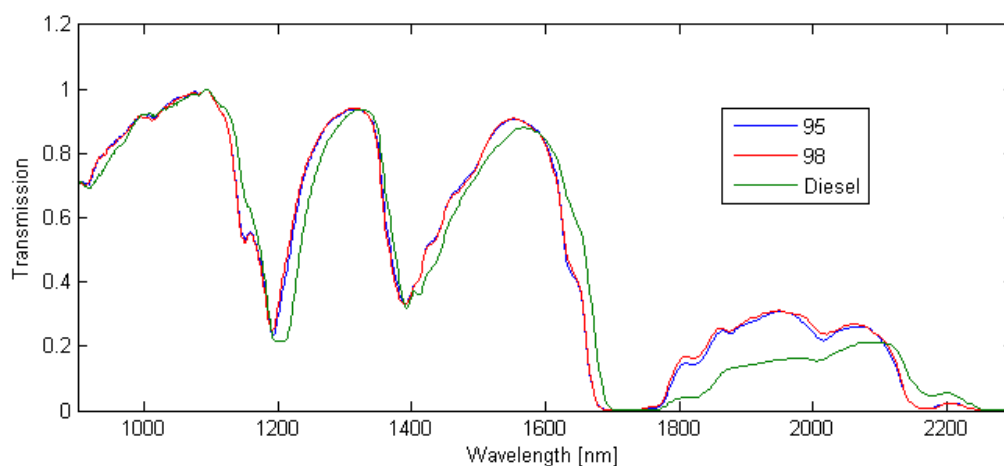
ORGANIC SOLVENTS

Organic solvents are typically completely transparent in the visible region, but exhibit strong absorptions in the NIR region (measured in a 1-cm thick cuvette). While their NIR spectra are quite similar, the composition of a mixture of such solvents can be identified with high accuracy by means of chemometric analysis.



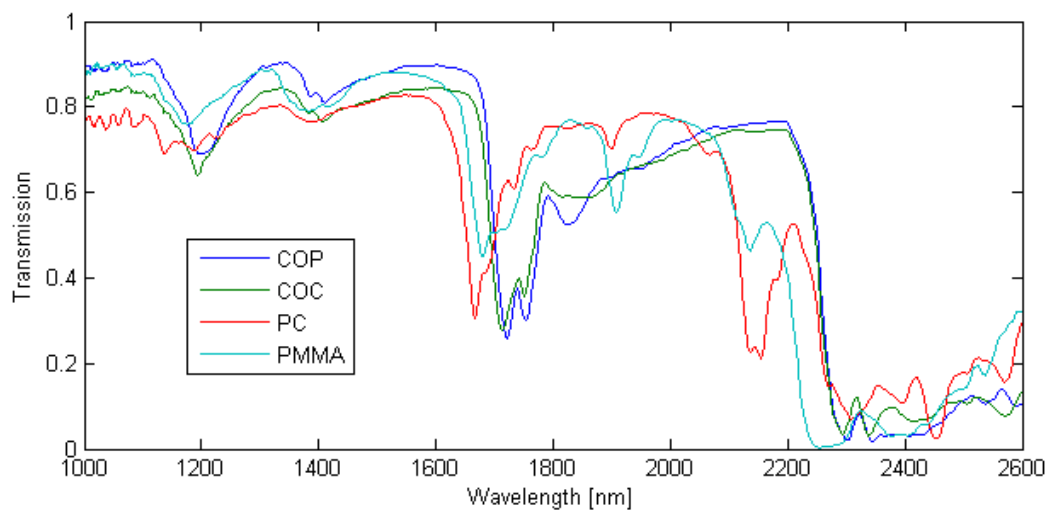
GASOLINE

Similarly as organic solvents, gasoline is also transparent in the visible range (visible colorants are sometimes added in order to distinguish different types). Although 95 and 98 octane gasolines look very similar, some spectral signatures can be distinguished by eye in at wavelengths around 1800nm and 2000nm.



PLASTICS

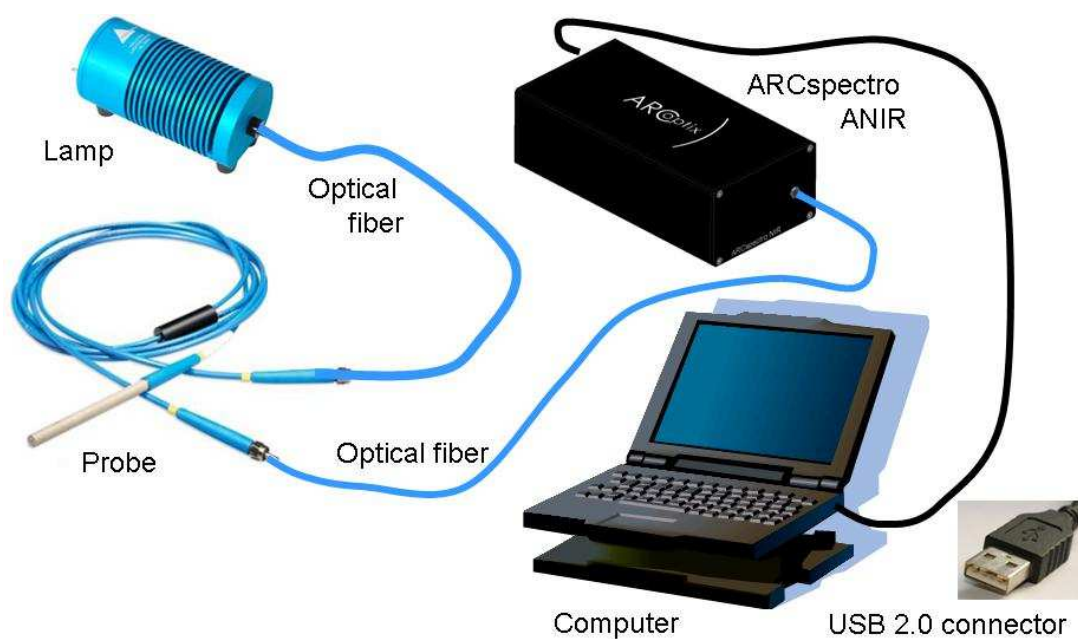
Many plastics that are transparent in the visible range exhibit very distinct signatures in the NIR range. Below are measurements made on several types of thermo-plastics (**COP**: Cyclo Olefin Polymer, **COC**: Cyclic Olefin Copolymer, **PC**: Polycarbonate, **PMMA**: Poly(methyl methacrylate)). Slabs were 1mm in thickness.



DIFFUSE REFLECTION SPECTRA

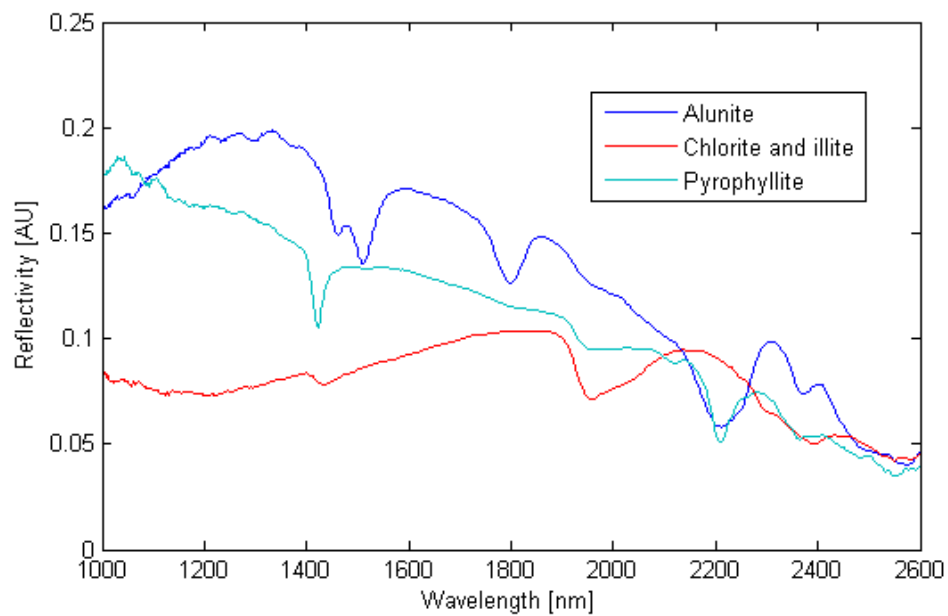
SET-UP

The sensitivity of the ARCspectro ANIR is sufficient for performing certain types of diffuse reflection measurements. In the examples below, a standard fiber reflection probe was used (model R600-7-VIS-125F, Ocean Optics). Illumination is provided by a 20W tungsten halogen light source (HL-2000 HP).



ROCKS

An example where diffuse-reflection spectral measurements prove to be useful is mineral identification. As it can be remarked on the measurements below, different sort of rocks exhibit distinct signatures in the NIR range, depending on their mineral composition.



DIFFUSING LIQUIDS

Diffusing liquids can be probed easily by dipping in a reflection probe. In this example, coffee cream is compared to milk.

