SPECTROSCOPY FIBERS

CeramOptec's fibers and various fiber probes are special flexible tools for remote spectroscopy in the wide range from UV to Mid Infrared (MIR): 0.2-16 μm.

Special pure silica core fibers, improved for UV (from 0.2 mm) or Near IR (to 2.5 mm), are designed with thin cladding for the high efficiency of coupling with spectrometer. Thin polymer jacket, as temperature resistant (to 380°C) polyimide coating, provides also the high coupling efficiency for very flexible fiber bundles. Fibers for spectrometer light delivery could be specially arranged (ring-catheter) or randomized (Y-shaped reflectance probe) with a fibers for signal detection. All bundles are suited in end's geometry with different FT-IR, Raman and other UV-VIS-NIR spectrometers.

Unique MIR-fiber probes, based on innovated bare core and core/clad polycrystalline Silver Halide fibers, provide the first opportunity for direct and evanescent remote spectroscopy in "finger-print" region of fundamental molecular vibrations 4-16 μm. They come with LN-cooled MCT-pig tail detectors and adjustable coupler for FT-IR spectrometers.

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Middle Infrared Fiber Accessory Kits for Remote IR-Spectroscopy MIFAK

Features
- Measurements in middle infrared region
  (4 - 16 μm or 2500 - 625 cm⁻¹)
- Possibility of remote monitoring
- Diversified fiber probe configurations
- Easy expandability and integrability

Applications
- Spectroscopic analysis of liquid solution in
  - chemical industry
  - food industry
  - enviroment pollutions
  - medicine
  - pharmacy

Components
- Adjustable input (1) and output (2) units
  specially adapted to FTIR spectrometer
- Various fiberoptical probes (3)
  and cables (4)

General outlet
- Probe with Specimen
  - Fiber Cable 4
  - Input & Output Units
  - FTIR Spectrometer

Spectra obtained using the MIFAK

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Fig. 1 Spectra of transmittance and optical losses of MIR-fibers

Fig. 2 Scheme of MIR-fiber probes with FTIR-spectrophotometer

Fig. 3 Scheme of TDL-spectrophotometer with MIR-fibers for gas analysis
**Fig. 4. Examples of spectra, obtained with NIR-spectrophotometer, and EELS-spectra of NIm with fiber multipass cell (c).**
MIR-FIBER PROBE FOR REMOTE FTIR-SPECTROSCOPY (3 - 15um)

MIR-fiber evanescent probe could be widely used with FTIR spectrophotometers for chemical analysis of liquids and gaseous substances. The accessory consists of three main parts:
1. Adjustable coupler unit to focus external beam of spectrophotometer to MIR-fiber,
2. MIR-fiber cable with evanescent probe,
3. Special HgCdTe (MCT)-detector connected with MIR-fiber tail or standard IR detector with collecting mirror.

**Specification.**

- Spectral range: 3 - 15 um
- Maximal diameter of spectrometer's external beam: 34 mm
- Divergency at the output end of fiber cable: 60°
- Fiber diameter: 0.5, 0.7, 1.0 mm
- Length of evanescent fiber active part: 3 - 50 cm

![Diagram of MIR-fiber probe and spectroscopy setup](image)

![Graph of H₂O sugar solution spectrum](image)