

Technical specifications for FTIR spectrometer with DRIFTS attachment

Scope

IIT Madras is looking to investigate catalytic reaction systems using FTIR (Fourier Transform Infrared spectroscopy) with focus on in-situ DRIFTS (Diffuse Reflectance Infrared Fourier Transform Spectroscopy) analysis of catalytic surface reactions over a range of operating temperatures and pressures. The requirement is of a complete end-to-end system for this purpose. The following specifications should be met to qualify the technical bid.

Requirements:

FTIR spectrometer

1. The entire unit should be capable of continuous operation under continuous gas flow
2. The minimum spectral resolution should be 0.1 cm^{-1}
3. The detector should be liquid nitrogen cooled MCT (Mercury Cadmium Telluride) detector with appropriate windows, with appropriate technical explanations.
4. The spectral range should cover mid IR: $4500\text{-}600\text{ cm}^{-1}$ range.
5. The unit should come with one touch sampling operation

Operating conditions

1. Operating temperature range: $25\text{-}900^{\circ}\text{C}$. Should be possible to control the reaction chamber temperature by computer controls.
2. Operating pressure range: $1\text{milliPa} - 1.5\text{mega Pascal}$ or higher

Diffuse reflectance accessory

1. The FTIR unit should be provided with a compatible DRIFTS accessory
2. The unit should be provided with high temperature reaction chamber with dome for DRIFTS accessory
3. Dome should be provided with windows of suitable materials compatible with the operating conditions.

Spectral analysis and post processing tools

1. Complete set of spectral data processing tools
2. Complete library of infrared spectra
3. Software with capability to perform background corrections in an automatic mode.

Compatibility and upgrade options

1. The FTIR unit should be upgradeable to include ATR (Attenuated Total Reflectance) module and compatible with add on GC (Gas Chromatograph) and Raman modules
2. Compatible with FTIR microscope and TGA accessory

Warranty, AMC, Installation and Training

1. 3 years of onsite warranty to be provided
2. Quote should include extra two years of AMC
3. On-site installation and training should be included.

Accessories, computer, and power

1. Dewar flask
2. Sampling cups
3. Branded compatible computer, monitor, and I/O devices with required software to be provided
4. Power rating and cords should be suitable for Indian systems. Power 230 V, 50-60 Hz, Indian socket