

**Nano Research Facility  
Indian Institute of Technology Delhi  
Hauz Khas New Delhi 110 016**

**Quotations are invited for the**

**NIQ for FTIR Spectrometer with ATR, Raman Module, and IR Microscope with the following specifications:**

**1. Advanced FTIR Spectrometer with far infrared, mid infrared and near infrared optics including:**

- 0.10-0.15  $\text{cm}^{-1}$  resolution (signal to noise ratio 50000:1) with variable aperture
- Long Lifetime Infrared Source
- Integrated scan buttons for scanning in Mid IR 11000  $\text{cm}^{-1}$  to 350  $\text{cm}^{-1}$
- DLaTGS detector for full Mid IR region
- XT-KBr beamsplitter and ready for beamsplitter changer
- Compatible and ready to accept FT-infrared microscopy, GC/IR, NIR, TGA and an FT-Raman modules
- Interchangeable beam splitter system and Internal beam splitter storage for additional beam splitters
- Optional components may be swapped for operation in near or far IR
- Tungsten-Halogen white light source
- High speed USB 2.0 interface
- Aligned mounting plates front/rear
- Mounts for emission optics and Raman detector
- Sealed and Desiccated with KBr sample compartment window  
Dual right and left external beam
- Standard Purge System: Includes Purge Regulator, tubing and spectrometer attachment
- Ready for operation of FT-Raman

**2. Computer for data acquisition system:** Complete interface electronics and custom software for running system. All capabilities of interface and software to be provided by vendor must be clearly mentioned and should be provided complete and functional in all respects as part of the system. The system should include software with at least the following document system operation

- Quantitative and qualitative method development and prediction
- Tools needed to develop calibrations and then perform predictions using Beer-Lambert's and Classical Least Squares

- Tools needed to perform predictions (but not to build calibrations) using discriminant analysis
- Automatic atmospheric suppression to remove H<sub>2</sub>O and CO<sub>2</sub> interferences (without standards)
- General Library for polymer additives and chemicals should be Included
- Group and Ungroup file capability for easy management of related sample data in a single file without loss of information
- Auto Report feature to automatically view results, print or add to current notebook
- System Performance verification (SPV) monitors system status
- Complete set of spectral data processing tools
- Spectral Search: high-resolution library generation search, library management customizable information fields, single or multi-region
- Multi user facility
- Extensive on-line help and video tutorials

### **3. ATR Attachment**

- A versatile **ATR** for analysis of solids, liquids, pastes and gels ready to use
- Diamond ATR single bounce for both solid and liquid samples
- Crystal Plates should be pinned in placed and easily switch able with no alignment required.
- iTR with Single Reflection
- The High Pressure Clamp with interchangeable tips for hard, soft and pellet shaped samples.

### **4. DEMOUNTABLE LIQUID CELL including**

- liquid cell body and assorted spacers
- CaF<sub>2</sub> windows
- spacers
- Syringes

### **5. RAMAN MODULE**

- Excitation source and 1064 nm laser with continuously adjustable laser power
- 400 mW- 500 mW.
- Spectral resolution 1.0cm<sup>-1</sup> better
- Fits in the sample compartment
- Clamping action makes all electrical contacts
- Laser turns on and is ready for operation within 30 seconds
- Dedicated InGaAs detector for Raman spectroscopy. Selection of detector through software

- Large sample compartment to accommodate powders, liquids in vials, tubes, bottles etc.
- The stage should enable to mount and accommodate samples like tablets, polymers, powders in horizontal position
- Built-in sampling stage
- With Polystyrene reference sample
- Computer controlled movement
- USB Camera for viewing and collecting visual images
- Compatible with Advanced spectrometers
- Rayleigh rejection filter for Stokes
- Compatible with sample compartment shutters
- Class I laser safe device
- Sampling kit with Sampling plates
- Combined 9-hole and microscope slide plate
- Combined 3-vial and 4-vial holder
- 48-well plate/96 well plates
- Should have Sample Stage Movement with microview.
- With complete software support for using FT-Raman module and storage of data, image analysis, array automation, data review capabilities, correlation and group analysis and rapid spectral comparison, basic stage control.

## **IR MICROSCOPE**

- Infinity Corrected Optics for Highest Quality IR and Visible Light Rendition
- On-Axis Optics with Coincident IR and Visible Light Paths
- Targeting Sample Illumination
- TruView, Continuous View / Sample Operation
- Motorized, ReFlex Pre and Post Sample Masking Aperture with X, Y, and theta Control.
- Automated Reflectance / Transmission Sampling Modes
- 50 Watt Brightfield Koehler Transmission Illumination with intensity and contrast control
- 50 Watt Brightfield Koehler Reflectance Illumination with intensity and contrast control
- Motorized Sample Focus
- Condenser Focus Control
- Integrated Contact Alert Electronics
- Dual Detector Upgradeable
- Purged System including Purge Regulator
- Trinocular Viewer with 10X Eyepieces
- Stainless steel LN2 dewars
- Microscopy sampling

- Automated ATR optical configuration with 4-Place Nosepiece, 10X Glass Refracting Objective, 15X Replachromat Objective, 15X Replachromat Condenser, Motorized Micro Positioning Stage with Controller, Dual Detector Optics, System should have room controlled or liquid nitrogen control detector and must have facility to update with 2-3 detectors, Digital Color Video Camera kit, X, Y Stage Control, Auto Reflex Aperture, Auto ATR Contact, Auto-Focus, Ge Tip ATR Crystal Slide-On with Integral Contact Alert
- Hardware interface, Complete software for Analysis Future up-gradation of the software free of cost

#### **Accessories and Miscellaneous Items:**

- Transmission accessory to make fast and accurate temperature controlled measurements of protein quality and secondary conformational structures from 5 to 80 °C and should include the USB controller and Software for protein analysis
- Branded PC with latest configuration with laser Printer
- Nitrogen gas with trap and cylinder for purging
- Indian Power cords
- Demountable liquid cell with KBr window
- IR grade KBr powder,
- Hydraulic press with Agar Pestle and Mortar, Pellet holder
- Operation manual should be included
- All instrumentation and gauges should come with controllers and any associated software/firmware for operating them. While a mostly manually operated system is preferred, in the case of any automation, the quotation must be for a complete functioning system in all respects.
- The vendor will be responsible for all installation and initial functioning of the equipment in NRF, IIT Delhi.
- All equipment must run on 220V, 50Hz. Power supply for critical functions may be backed up separately with a UPS (1 KVa, 30 min back up)
- FTIR System should be latest and all the required spares should be available for at least next ten years as and when required
- Installation and Training should be provided at the site of installation free of cost
- All the accessories and optical mounts needed for the complete functioning of all the modules of the said FTIR spectrometer should be provided by Vendor.
- All the calibration samples for all the modules should be supplied by Vendor

#### **Terms and Conditions:**

1. **Technical and financial bids** should be in **separate sealed envelope** and Super scribed by NIQ number and date.
2. Sealed quotations should reach to Dr. Prashant Mishra, Nanoscale Research Facility, Indian Institute of Technology Delhi, Hauz Khas. New Delhi-110016 by **February 28, 2013.**

3. The prices should be quoted at FOB
4. Propriety and agency certificate will be required wherever applicable.
- 5 Institute reserve the right to accept or reject any or all the quotation without showing any reasoning.
- 6 Comprehensive Warranty for 2 Years



