

Minutes of the pre-bid conference

Tender Notification No.: NITT/F.NO:SIF012/PLAN2013-14 dt: 19.12.2013

With reference to the above tender notification and the pre-bid conference held on 30.12.2013 at 2.00 PM in the committee room of Physics department, the following amendments are made.

Specification for Micro Raman Spectrometer

Original tender specification	Amended specification
<p>Micro Raman Spectrometer, including a confocal microscope, transfer and filtering optics, an achromatic spectrograph equipped with gratings, multichannel detector, multi lasers, computer controlled xyz stage and the relevant software and computer platforms with the following specifications. <u>The cost for each of the optional items mentioned in 7, 9 and 10 for Lasers, filters and temperature controller should be separately mentioned in the quotation.</u></p> <p>1) Spectrometer: A large focal length Czerny-Turner type achromatic spectrograph equipped with reflective optics</p> <p>a) Spectral Range : 200nm–2100 nm</p> <p>b) Spectral resolution: < 0.4 cm⁻¹ for 633 nm with 1800 groves/mm grating</p> <p>c) Spatial resolution: True confocal microscope: laser diameter smaller than 1 micron and axial confocal performance better than 2 microns. The system should be optimized for 100x objective lens measurement.</p> <p>d) Gratings – 2400 gr/mm (for UV), 1800 and 600 gr/mm mounted on a motorized turret driven by software, to vary spectral resolution. The gratings should be quickly and easily interchangeable without realignment.</p> <p>e) Interface : USB and/or IEEE-488</p> <p>f) Power supply : 220-230 VAC, single phase</p>	<p>Micro Raman system, including a confocal microscope, transfer and filtering optics, an achromatic spectrograph equipped with gratings, multichannel detector, multi lasers, computer controlled xyz stage and the relevant software and computer platforms with the following specifications. <u>The cost for each of the optional items mentioned in 7, 9 and 10 for Lasers, filters and temperature controller should be separately mentioned in the quotation.</u></p> <p>1) Spectrometer: A large focal length Czerny-Turner type achromatic spectrograph equipped with reflective/refractive optics</p> <p>a) Spectral Range : 200nm–2100 nm</p> <p>b) Spectral resolution: < 0.4 cm⁻¹ for 633 nm with 1800 groves/mm grating</p> <p>c) Spatial resolution: True confocal microscope: laser diameter smaller than 1 micron and axial confocal performance better than 2 microns. The system should be optimized for 100x objective lens measurement.</p> <p>d) Gratings for suitable wavelengths – 2400 gr/mm (for UV), 1800, 1200 and 600 gr/mm mounted on a motorized turret driven by software, to vary spectral resolution. The gratings should be quickly and easily interchanged without realignment.</p> <p>e) Interface : USB and/or IEEE-488</p> <p>f) Power supply : 220-230 VAC, single phase</p>

2) Entrance optics assembly:

- a) A filter wheel/variable filter controlled by software for decreasing laser power on sample
- b) Laser line filters
- c) An adjustable kinematic rejection filter (Notch or Edge) mount allowing fine tuning of the filter operation angle for low frequency cut-off adjustment and easy and quick exchange of excitation wavelength.

3) Microscope with high stability :

- a) With Removable bottom stage
- b) An internal white light illuminator by transmission supplied with an Abbe condenser
- c) A revolver equipped with 5 pan-achromatic objective-lenses: 10x, 50x (high NA, long working distance), 100x and suitable objective for UV.

4) Confocal coupling optics between the microscope and the spectrometer:

- a) A continuous adjustable confocal pinhole from several microns to 1.2mm driven by software
- b) Direct coupling optics to couple the lasers to the Micro raman system.

5) MICROSCOPE STAGE: XYZ motorized stage with X-Y:70 (± 10) x 50 (± 10) mm step-size lesser than or equal to 0.1 microns. Positioning joystick, controller, computer interface card, drive electronics and software. Automated acquisition of Raman maps in conventional and XY scan mode. Micrometric computerized z-axis control: Minimum step size should be 0.5 micron.

- g) CCD detector with peltier cooled to -60°C pixels of 1024 x 256
 - a) The spectral range: 200nm to 1050 nm
 - b) very low noise levels
 - c) Quantum efficiency $> 30\%$ (visible and IR wavelengths)
 - d) Interface : USB and/or IEEE-488

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- b) Direct coupling optics to couple the lasers to the Micro raman system.

5) MICROSCOPE STAGE: XYZ motorised stage, X-Y, 70 (± 10) x 50 (± 10) mm, step-size lesser than or equal to 0.1 microns. Positioning joystick, controller, computer interface card, drive electronics and software. Automated acquisition of Raman maps in conventional and XY scan mode. Micrometric computerized z-axis control: Minimum step size should be 0.5 micron.

6) CCD detector with peltier cooled to -70°C pixels of 1024 x 256

- a) The spectral range: 200nm to 1050 nm
- b) very low noise levels
- c) Quantum efficiency $> 30\%$ (visible and IR wavelengths)

e) Power supply : 220-230 VAC, single phase or 440 VAC, 3 phase

7) Laser Options -1 (The lasers should be supplied along with coupling optics and necessary mounts to the Raman system along with necessary Raman filters to record Raman from 50 cm⁻¹ for visible and NIR, 200 cm⁻¹ for UV).

a) 325 nm : He-Cd laser Power Range 15 -20 mW

b) 532nm : 40 to 50 mW

c) 632.8 nm: Air cooled He-Ne laser >15 mW

d) 785 nm: air cooled intra cavity regulated laser diode (for maximal confocal performance) ≥100 mW

8) Computer and software:

a) Software should be compatible with Windows and should be supplied with two computer dongles permitting the control of the instrument, data acquisition, and data manipulation including Raman and photoluminescence mapping and storage option. The software should have advanced chemo-metric and Macro programming capabilities.

b) A computer with latest configuration, along with TFT monitor

9) Accessories (Quote separately)

Optional –II (Filters): Low frequency filters (~ 10 cm⁻¹ for 532 and 785 nm).

Option for micro-photoluminescence measurement (325nm, 532 nm)

a) Polarization accessories – polarizer and analyzers at 325, 532, 633

d) Interface : USB and/or IEEE-488

e) Power supply : 220-230 VAC, single phase or 440 VAC, 3 phase

7) Laser Options -1 (The lasers should be supplied along with coupling optics and necessary mounts to the Raman system along with necessary Raman filters to record Raman from 50 cm⁻¹ for visible and NIR, 200 cm⁻¹ for UV).

a) 325 nm : He-Cd laser Power Range 15 -20 mW

b) 532 nm : 40 to 50 mW (This Laser should be provided along with the system)

c) 632.8 nm:–Air cooled He-Ne laser >15 mW

d) 785 nm: air cooled intra cavity regulated laser diode (for maximal confocal performance) ≥100 mW

8) Computer and software:

a) Software should be compatible with Windows and should be supplied with two computer dongles permitting the control of the instrument, data acquisition, and data manipulation including Raman and photoluminescence mapping and storage option. The software should have advanced chemo-metric and Macro programming capabilities.

b) A computer with latest configuration, along with TFT monitor

(Minimum requirements :Intel Core i7 Processor 3470, 3.2 GHz upto 3.6 GHz, 6M, vPro, 3rd Generation processor, 4 Core, Intel Q77 Express Chipset based motherboard or better chipset, 8 GB DDR3 SDRAM Non-ECC (1600 MHz) Dual Channel, Single 500 GB 7200 rpm,32MB buffer, SATA 3.0, 6 Gb/s. Specify the make & Size of the HDD, USB Keyboard (Windows Keyboard with US key layout), USB 2-button optical mouse with scroll and Mouse Pad, Integrated 10/100/1000 -Tx NIC with PXE BOOT ROM support, Should support min True color (16.7 million colors) at 1920 x 1200, 24-bit, Without OS (windows xp/7/8))

9) Accessories (Quote separately)

Optional –II (Filters): Low frequency filters (~ 10 cm⁻¹ for 325, 532, 633 and 785 nm).

and 785 nm

b) Standard sample holder attachment for 1cm x 1cm cuvette to study liquids and solutions

10) Optional –III (Temperature controlled stage)

a) Temperature controlled stage (-196 deg C to 600 deg C)

b) Angle-calibrated rotation stage

11)Others

a) Manual – technical aspects with service details (electronic and hard copy)

b) Installation – at NIT-Trichy

c) Training – Free training to NIT-T faculty members/ students

d) Warranty – 3 year on-site warranty (give details including scope, no. Of visits, etc.)

Note: Any other accessories apart from the mandatory accessories and systems mentioned above may be quoted separately. Pre-installation/post-installation training expenses (including travel, boarding and lodging) should be born by the supplier.

Option for micro-photoluminescence measurement (325nm, 532 nm)

a) Polarization accessories – polarizer and analyzers at 325, 532, 633 and 785 nm

b) Standard sample holder attachment for 1cm x 1cm cuvette to study liquids and solutions

10) Optional –III (Temperature controlled stage)

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Dr. B. Karthikeyan,
Asst. Prof., Department of Physics,
NIT-Trichy