

Technical Comparison and Recommendation


E-Tender No. NIT-38/2018 (NC-000974-12-R&D-NIS-5.10-0100-18-19)


Specifications for FT-ATRIR Spectrometer			
		Bruker	Mars
1	1. Spectral Range: $\leq 80 \text{ cm}^{-1}$ to $\geq 25000 \text{ cm}^{-1}$	80-25000cm-1	80-25000cm-1
2	2. Wavenumber Repeatability: $\pm 0.02 \text{ cm}^{-1}$ or better		
3	3. Wavenumber accuracy: $\pm 0.05 \text{ cm}^{-1}$ or better		
4	4. Spectral Resolution: 0.2 cm^{-1} or better, with at least 50 spectra/sec at 8 cm^{-1} or better for rapid scan. Step/Slow Scan Option for stepwise and slow scanner movement for temporal resolved spectroscopy (TRS) data acquisition with temporal resolution down to $6 \mu\text{sec}$ or better and with an optional transient recorder down to 4 nsec or better. Slow Scan functionality down to $\text{VEL} \sim 10 \text{ Hz}$ with variable scanner velocity setting and interleaved TRS functionality	0.16cm-1 50spectra/sec at 8cm-1 resolution	0.2cm-1 50spectra/sec at 8cm-1 1 resolution
5	5. Mode of detection: Absorbance, Transmittance etc., Accessories like Diffusion reflectance and Specular reflectance with variable angle $\leq 30^\circ$ to $\geq 80^\circ$ with software controlled automated angle change should be quoted.	Complied	complied
6	6. Signal to Noise ratio: $\geq 50000:1$ peak to peak for one minute scan	50000:1	50000:1
7	7. Sources: Long life light sources that can cover spectral range $\leq 80 \text{ cm}^{-1}$ to $\geq 25000 \text{ cm}^{-1}$. Source should have min. 5 years of warranty. The sources for different wavelength selection should be done automatically. The source should not require other accessories or conditions such as cooling or heating, pumping and vacuum etc.	Complied	complied
8	8. Windows: KBr, CaF ₂ , BaF ₂ , ZnSe or any other appropriate windows in the sample compartment to cover the mentioned spectral range.	KBr,BaF ₂ , Polyethylene window	KBr,BaF ₂ , Polyethylene window
9	9. Sample holders and accessories: Demountable multipass gas cell $\leq 1 \text{ m}$ to $\geq 8 \text{ m}$ variable path length, with quartz windows	Complied	complied
10	10. Detectors: DLaTGS detector and / TE cooled InGaAs Detector or appropriate detectors to cover the whole spectral range. Automatic selection of detector for different spectral range. Detectors should have min. 5 years of warranty. The	DLATGS detector	DLATGS detector
11	11. ATR: ATR accessory with monolithic Diamond to cover spectral range from $50-10000 \text{ cm}^{-1}$.	Diamond ATR Complied	Diamond ATR Complied
12	12. Interferometer: Fast scanning and self- compensating or permanently aligned interferometer. 10 years warranty on the scanning mechanism must be included	Complied	complied
13	13. Mirrors: High reflectivity mirrors	Complied	complied
14	14. Automatic Shutters: All the shutters and beam splitters should be automatic and motorized.	Automatic	automatic
15	15. Air flow purge: N ₂ or dry air	Complied	Complied
16	16. Cryogenic Cryostats: Continuous flow liquid N ₂ cryostat with $>10 \text{ L}$ liq. N ₂ dewar and necessary vacuum pumps, quartz windows and mirrors to carry out variable temperature and time resolved IR studies at low temperature. Temperature range: $\leq 85 \text{ K}$ to $\geq 420 \text{ K}$	Complied -25 to 150 °C	complied -25 to 150 °C
17	17. Electrochemical Cell: Dedicated accessory for electrochemical analysis should be available. The electrochemical accessories should able to study electrolyte solutions and small layers on electrode surfaces in both ATR and transmission/Reflection mode. The unit with exchangeable angle inserts for 30° or 45° and 60° angle of incidence. The system should able to configure and communicate through Software with available potentiostat. Trigger functionality should be available for synchronization. Whole Spectro-electrochemical experiment should be controlled via either the FTIR software or potentiostat software. The accessory must be upgradable with polarizer in future for passing polarised beam	Complied	complied
18	18. Protein IR: Protein accessories for the determination of conformation and concentration of proteins dissolved in aqueous buffers and formulations and also for solid powder analysis. Fixed pathlength flow through transmission cell ($<8 \mu\text{m}$) with CaF ₂ windows and Variable temperature facility. Photo Voltaic MCT detector to be quoted for better sensitivity. Readymade Calibration protein secondary structure analysis to be provided. Advanced quantification software for Chemometrics and PLS must be quoted. Cleaning solution for adsorbed protein must be provided. Suitable Thermostat with $\pm 0.1^\circ\text{C}$ accuracy to be provided. Multi-reflection accessory to be provided with Variable Temperature control and Thermostat to be provided for studying soluble and insoluble protein samples. Temperature ramping, pH and temperature induced studies of folding / unfolding, aggregation of protein samples must be possible. The suitable Protein analysis software and protein library should be included for protein IR spectra analysis.	Complied	complied
19	19. Thermostat: It should cover temperature range from $\leq -25 \text{ oC}$ to $\geq 150 \text{ oC}$ and temperature precision $\leq 0.1 \text{ oC}$	Not mentioned	Not mentioned


21	20. Software and IR Library: 1. Comprehensive suite of control functions with multi-level user interface, graphical display of optical ranges for optimized operation, automatic instrument setup with smart sample accessories, automated changing of spectral ranges, extensive range of derivative, smooth, subtraction, normalization, generation of ascii files for the and other spectral data transform should be available. 2. IR Libraries : Library of compounds ($\geq 25,000$ chemicals and biomolecules) consisting of Polymers, additives, cosmetics, organic and inorganic chemicals, biochemicals, fibres, proteins, fatty acids, lipids, ingredients, natural products, silicon containing compounds, solvents, pesticides, pollutants, semiconductors, dyes, paints, coatings, food, food additives, minerals, lubricants, surfactants, kidney stones, pharmaceuticals and drugs etc.	complied	complied
22	22. Peripheral and Additional Accessories: 1. Branded desktop (with DVD drivers, at least 4 USB ports, 21 inch or larger LED monitor, keyboard and mouse) of recent model for spectrometer control and data acquisition. 2. At least 15 ton hydraulic press with KBr Die set, Agate mortar and pestle, Pellet holder and Spectroscopy grade KBr powder. 3. 5 KVA UPS with 1 hour back up and Dry Air compressor to be quoted for Far-IR measurements. 4. One additional fixed path length flow through transmission cell ($< 8\mu\text{m}$) with CaF ₂ windows for protein IR 5. One additional demountable liquid cell with CaF ₂ windows 6. Additional KBr, CaF ₂ or any other appropriate windows in the sample compartment to cover the mentioned spectral range. 7. Additional option/ port/ extension for integrating Polarizer, VCD and Stopped Flow accessories with the spectrometer.	Complied	complied
23	23. Installation and Warranty: 1. Installation and integration of all supplied hardware and software shall be done by the vendor. 2. The supplied hardware should have 3 years on-site comprehensive warranty and support including upgrades of BIOS, firmware and patches etc. 3. Minimum of 5years of warranty on sources and detectors and 10years warranty on mechanical parts. 4. The warranty period will commence from the date of certification of successful installation and demonstration of benchmark tests. 5. Instruments must be attended within a week in case of breakdown. Downtime of instruments will be less than 4% (apprx. 15 days for a year) of the warranty period per year. In the event of longer downtime the vender shall increase the comprehensive maintenance period by five times of the downtime. 6. Vendor should assure the availability of the spares for minimum of 8 years from the date of installation	One year warrenty with extension. Warrenty issues needs to be clarified.	Warrenty issues needs to be clarified.

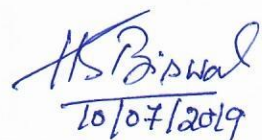
AMC Charges after expiry of warranty (in percentage)


Both the parties are technically qualified.


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