

SPECIFICATIONS FOR GAS CHROMATOGRAPH

We require a Gas Chromatograph with following specifications.

Microprocessor controls with keyboard entry of process parameters and timing functions with user friendly software in ROM, method development facility and electricity failure back up. Automatic Temperature programming facility with four RAMPS for Oven. Initial mid and final timing and auxiliary temperature control channel besides oven. Injector and Detector with Auto Diagnostics facility & Auto cooling facility complete with necessary standard accessories.

WITH BELOW CONFIGURATION: -

1. Dual FID single output with shielding wire with platinum electrode for stability and noise less signal
2. TCD Detector
3. Dual packed column injector ports
4. Single channel chromatography interface with software.
5. Capillary column attachment for connection of capillary column
6. Suitable computer
7. Standard accessories for installation of GC
8. Gas handling and purification system along with accessories and Double stage cylinder regulator with brass body with stainless steel diaphragm & 63 mm machine shield stainless heavy duty pressure gauge for primary and secondary side with safety valve. For hydrogen, nitrogen, zero air gases.

GAS CHROMATOGRAPH WITH BELOW FEATURE:

- All glass system
- FID quartz jet
- Proven modular system
- Imported Cat ridge heaters for base body heating
- Platinum temperature sensors
- Microprocessor based digital temperature controller
- State of art modular chromatography
- Wide range of detectors & Automation capability
- Provision for two packed / capillary columns
- Provision for methaniser, cryogenic attachment
- Multidimensional chromatography
- Full line of valves
- Modular system, all individual modules like oven, fid & tcd and data station and computer, printer
- Digital Temperature Monitoring for Injector, Oven, Detector and Auxiliary channel of any
- Swagelok Type International Standard Stainless-Steel Connectors
- Output on Terminals For Recorder, Integrator and Data Station Provided
- 5 ramp operation, 9 method files for programmable data storage
- Auto Diagnostics facility & auto cooling facility
- Auto repeat Runs 0- 999
- Programming rate 0- 29.9 deg C in 0.1 deg C step
- Provision for Auxiliary temperature controls for feature up gradation GC with any detector
- Provision for feature up gradation of any modules like cryogenic attachment, head space attachment and others detector and temperature controllers
- All data will be stored and retrieved from the computer at any time
- **Power Supply**
 - 230 VAC \pm 10% @ 50/60 Hz Accessories
 - Suitable computer with B/W printer should be provided along with the system
 - Gas Cylinders with Regulators and Purifications for all required gases
 - General Purpose 30 mtr capillary column and packed column
- **Conditions:**
 1. Should submit test reports no, test reports date, name of laboratory
 2. 1-year on-site warranty
 3. The quoted model must have last 5 years of working experience in any government organization with performance certificate
 4. Before finalization of order supplier must arrange working demonstration of the instrument.
 5. Provide List of users in India.

NOTE: The Specifications quoted by the Firms must match with the University requirements.

- System should have high sensitivity temperature-controlled DLaTGS /DTGS detector which should be highly stable against external temperature changes.
- System should have the spectral range from 8000-350 cm^{-1} or better with KBr beamsplitter.
- Wave number Accuracy: Should be better than 0.05 cm^{-1} @ $2,000 \text{ cm}^{-1}$ and Resolution of the system should be better than 0.6 cm^{-1} .
- Signal to Noise ratio: Should be minimum 35,000:1 (Peak to Peak, One Minute) or better for one minute and wavenumber precision should be better than 0.001 cm^{-1} @ $2,000 \text{ cm}^{-1}$.
- The system should be offered with direct analysis [ATR] Accessory without any sample preparation for the samples like Solids, Liquids, Gel, Paste, LDPE, HDPE etc.
- Offered ATR sample top plate should be universal and can be user changeable to different crystal components.
- Sampling modules should be automatically identified and spectral test routines should automatically start to verify accessory performance and the system should have the open sample compartment provides compatibility with hundreds of other third-party accessories.
- The offered system should have temperature controlled solid state diode laser with long lifetime.
- The interferometer should be permanently aligned. Dynamic and mechanical alignments (either manual or automatic) are not acceptable.
- The system should include User-replaceable components (without opening cover): Desiccant, power supply, sample compartment windows & infrared source.
- System should have dynamically aligned interferometer with KBr mid-infrared beamsplitter optimized for highest spectral throughput. The system should have continuous electronic monitoring of spectrometer components with temperature and inbuilt humidity sensor. System should have spectral library of 10,000 spectra or more.
- The system should have an automated internal NIST-traceable 1.5 mil polystyrene film (serialized) validation unit. The internal validation unit should and be fully software controlled.
- System should have multi coloured display to show the system status. All system optics should be sealed in a metal alloy chassis for enhanced durability, robustness, and moisture control.
- System should be offered with the latest software which should have all the required latest features for FTIR analysis.
- All the necessary accessories should be supplied along with the system: Suitable Branded PC & Printer, 15 Ton Hydraulic Press, KBr Die Set, Liquid Demountable Cell with KBr windows, Agate mortar and pestle, KBr Powder.
- The system should be warranted for one year, the interferometer, Laser & Source should be warranted for 10 years.
- System should carry 3 Years of free AMC after completion of Standard One year Warranty

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SPECIFICATIONS FOR FT-RAMAN SPECTROMETER

- The spectrometer should be able to record the spectrum of a sample in the wave number region of 7800-350 cm^{-1} or better
- The spectral resolution should be better than 0.10 cm^{-1}
- The spectrometer must have a motorized, continuously variable aperture, for optimal peak shape collection of data
- The Interferometer must be a dynamically aligned, non-air bearing/air bearing/any other advanced type Michelson design
- A dedicated beamsplitters must be available to cover spectral range for better quality spectra
- Signal to Noise Ratio: The instrument must be capable of SNR of 65,000:1 or better peak to peak for one minute scan and 13000:1 peak to peak for 5 second scan.
- Wavenumber precision should be better than 0.0009 cm^{-1}
- Optics must be Gold Coated
- The spectrometer cover shall be sealed and desiccated and must be equipped with coated KBr sample compartment windows. The instrument must be equipped with the necessary internal plumbing and external connector for optional purge operation
- The system should have DLaTGS detector for Mid IR
- The system must have source for MID, NIR and FAR IR spectral range Source, Beamsplitter and detectors must be software selectable
- System must be offered with minimum 10 years of warranty on source and interferometer. It should be mentioned on the brochure/specifications or should be offered with proper part number
- System should have feature for humidity and vapor protection, should have tightly sealed and desiccated optics to have minimal problems with moisture and vapors
- System should be supplied with rechargeable desiccants
- The instrument shall be upgradable to FTIR Microscope, TGA-IR, GC-IR. Instrument should be able to be upgraded with accessory which can do reaction monitoring by varying temp, pressure, and vacuum
- System should have the facility of at least two external output beams and two external source inputs
- Software should have tools for Quantification method development and prediction using Beers' law, and chemometric algorithms like PLS, PCR. Software should have advanced processing features such as deconvolution or peak resolve, derivative, interferogram etc
- ATR Accessory: ATR with monolithic Diamond and ZnSe should be offered separately. A monolithic diamond ATR and optical base must have five years of warranty
- The spectrometer shall include a sample compartment FT-Raman module. No external connections or sample compartment extension must be required for operation of the FT-Raman module
- The Raman module must include a 1064 nm laser giving 450 mW or better with a 60-micron spot size at the sample. The module must also contain a software-controlled XYZ horizontal motorized sample stage and a built-in color USB camera for view-and-collect operation
- The enhanced Raman InGaAs detector must be mounted internal to the spectrometer for optimal performance and sensitivity
- The sampling stage must have a range of motion of at least (x, y, z) 100 mm x 62 mm x 21 mm
- The sampling stage shall permit a variety of sampling tools, including but not limited to a half well-plate (48 wells), a microscope slide holder, a flat pan for general sampling and holders for NMR tubes and small vials
- The Raman module sampling stage will automatically move to a position for easy sample removal when the door of the module is opened
- The Raman module will be certified as being a Class 1 laser product, and must enable an interruption of the laser beam when the door is opened
- One person must be capable of inserting the FT-Raman module, which will align on pins and then clamp in place. The process of clamping the unit in place shall complete the electrical connections for power, video and stage control
- Data collection with the FT-Raman module must permit single points, array (for well plate high-throughput screening applications), line and area map collection. Software must support all these sampling modes and provide tools to review and analyze the data, such as cluster analysis and PCA
- Selection of the sample compartment using the associated one-touch button when the FT-Raman module is present will result in correct beamsplitter choice (if the automated beam splitter arrangement is present), selection of the correct optical path through to the detector and will reflect changes in the software interface indicative of the FT-Raman module usage
- Additional Software should be offered for automated mixture analysis for automated spectral subtraction followed by library search with at least 30000 spectra
- System should have default warranty for 1 year and should include 3 years of free AMC after standard 1 year warranty
- Suitable branded and compatible PC + Printer, hydraulic press, and 2 KVA ONLINE UPS with minimum 30 min.

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SPECIFICATIONS FOR UV/VIS SPECTROPHOTOMETER

- True Double Beam UV - VIS Spectrophotometer with variable Slit width 0.5,1,2 & 4nm with automatic 8-Cell Changer and GLP Software
- System should offer the Wavelength range from 190 to 1100nm & the stray light should be better than 0.02% T
- The system should have provision for stand-alone and external PC operation through UV software Double Beam optics with holographic grating in Czerny-Turner mounting, Monochromator
- High intensity Tungsten Halogen and Deuterium lamp with automatic changeover
- High sensitivity matched pair Silicon Photodiode detector. Compliance with all Pharmacopoeia requirements
- System should have Built in validation program diagnostic and security functions
- System should have the following Operational modes:-Standard Photometric ii) Quantitative iii) Spectrum scans iv) Kinetics [Enzymatic] Studies DNA and Protein, vi).Custom method & vii) Multiwavelength measurement and should be GLP/GMP compliance system
- System should have a large Sample compartment compatible with wide range of accessories
- It should have wavelength slew rate: 6500 nm/min
- The system should have photometry range from -4 to 4 A or better
- The system should have noise range of ≤ 0.000016 Abs RMS @ 500 nm or better
- The system should have baseline stability of ≤ 0.0002 A/h @ 500 nm
- Vendor should enclose detailed list of users in India with contact details and should enclose at least 3 similar models performance letters from the Govt customers
- System should carry a warranty of 12 Months from the date of installation
- **System should be supplied with 3 Years of free AMC after completion of Standard One year Warranty**
- System should be supplied with suitable branded PC & Printer

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Fully automated computer-controlled element analyser capable of rapid quantitative determination of elements viz. Carbon (C), Hydrogen (H), Nitrogen (N), Sulphur (S) & Oxygen (O) in wide analysis of organic substances.

1. The instrument should have following features:

- Built-in helium and oxygen pressure reducers and gauges preventing air diffusion into the pneumatic circuit.
- Combustion/reduction in a single furnace with electronic temperature control offering full compliance with the most demanding safety regulations.
- Quick connectors to simplify the reactor connections without any need of tool.
- Classical GC separation column for reliable gases separation method. Adsorption desorption separation technique will not be acceptable.
- Detector oven with electronic temperature controller.
- Thermo-regulated Electronic Flow Control of helium & Oxygen.
- Automated programmable wake up, start-up and stand-by functions enhancing the independent operation of the Analyser and minimizing running cost.
- System should have dedicated furnace for CHNS & separate dedicated furnace for oxygen.
- System should have automated gas switch over accessory.

2. Measuring Range: 0.01% (100 ppm) - 100% for solid samples & 1-10 ppm (low level) for liquid samples (using TCD Detector).

3. Sample size: 0.01 mg to 100 mg or more depending on nature of sample.

4. Furnace:

- Furnaces: Maximum temperature of 1100 °C with 15-years warranty provided by OEM under standard operational conditions.
- Furnaces with Maximum temperature of 1100 °C or more.
- Decrease by 50% of the furnace temperature in Stand-By Mode.
- There should be full compliance with general safety regulations.

5. TCD Detector: Housed in a thermally insulated environment (GC oven) and maintained at constant temperature, Maintenance free Thermal Conductivity Detector (TCD) with 5- years warranty provided under standard operational conditions.

6. GC column: GC separation Column should be non-consumable under standard operating conditions.

7. Autosampler:

- Two Autosampler with a capacity of 32 sample positions or more. (Separate for Oxygen furnace)
- Dedicated viewer which enables real-time monitoring of the flash combustion.

8. Software:

Window based operating software controlling the instrument operations, recording data, performing calculations, diagnostic recording like leak testing and condition monitoring, and manage calibration procedures.

- Pre-set default methods (instrument, integration, calculation, and reporting parameters) available for an easy instrument start-up and running.
- User reference library: to promptly check sample quality versus a selected reference.
- Automated Leak Check through Electronic Flow Controllers
- Maintenance Control Program
- Automated Evaluation of the Empirical Formula: a valuable tool for obtaining the empirical formula of the sample with a straight forward function
- Automated and programmable wake-up, start-up, shut-off.
- Control of Solid and Liquid Autosampler through one single software.
- Automated transfer of the weight from the balance to the software.

9. Accessories:

- Sample Analysis Kit: CHNS kits for 2000 samples analysis should be supplied.
- Sample Analysis Kit: Oxygen kits for 2000 samples analysis should be supplied.
- Suitable configuration of Computer, window 10 operating system and Monitor.
- UHP Helium (99.999% Purity) with Gas filled in 47Ltrs water capacity.
- 9.5 UHP Oxygen (99.999% Purity) with Gas filled capacity 47Ltrs water capacity.
- Gas traps should be provided for flow check.
- Microbalance, UPS, and liquid sample accessories.
- Any other paraphernalia for setting up this instrument.

➤ Conditions:

1. Should submit test reports no, test reports date, name of laboratory.
2. 1-year on-site warranty.
3. The quoted model must have last 5 years of working experience in any government organization with performance certificate.
4. Before finalization of order supplier must arrange working demonstration of the instrument.
5. Provide List of users in India.

NOTE: The Specifications quoted by the Firms must match with the University requirements.

SPECIFICATIONS FOR : BENCH-TOP NMR

- Benchtop NMR with permanent magnet which should work without cryogenics / aircompressor / Nitrogen gas supply and should have operating frequency of 60 MHz or Higher.
- The offered system should have the Magnetic Field Strength of 1.4 T or Better.
- The offered system should offer the NMR Experiments like 1D, homo- and hetero-nuclear 2D experiments, including COSY, NOESY, HSQC, APT etc.
- It should have 03 nuclei ^1H , ^{19}F , ^{13}C in a single probe, so that no probe change required.
- The sensitivity, should be S/N:200:1 or better for 1% ethylbenzene.
- The offered system should have the Resolution, less than or equal to ≤ 0.4 Hz at FWHM (full width at half maximum).
- System should carry a warranty of 12 Months from the date of installation.
- **System should be supplied with 3 Years of free AMC after completion of Standard One year Warranty**
- System should be supplied with Standard NMR tubes of 100 Nos.
- The offered system should have an external hardware lock facility which does not require any deuterated solvent.
- The offered system should be able to shim for each sample not required.
- The system should be supplied with data acquisition software and processing software.
- Data acquisition software should be capable of outputting file format readable with other general software's.
- The system must be offered with online reaction monitoring with software & autosampler options. And relevant detailed technical notes for the same should be enclosed in the tender.
- Vendor should enclose detailed list of users in India with contact details and should enclose at least 3 similar model performance letters from the Govt customers.
- System should be supplied with suitable branded PC & Printer.

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**WE INTENDED TO PURCHASE MICROWAVE MUFFLE FURNANCE TO ASH SAMPLES
WITH UNMATCHED SPEED AND SAFETY**

- The instrument should have an on-board touch-screen interface you'll save time and simplify workflow.
- **High Temperature Furnace :** The instrument should have high temperature furnace which can heat the samples up to 1200 °C.
- **Furnace Capacity :** It should hold up to 8 (20/50 mL) or 5 (100 mL) Quartz Fiber Crucibles
- **Safety:** System should have active ventilation to keep the lab free from soot and Odors.

It should have NIST-traceable thermocouple to ensure accurate temperature control.

It should include Quartz fiber crucibles which cool to the touch in seconds.

- The offered system should meet to Various ASTM, USP, IP ,AOAC, FDA, ISO, and DIN methods
- **Option :** The system should be able to Pair with balance and printer for automatic results and should be offered these accessories optionally.
- **Fast :** The system should have One-step ashing - complete pre-ash inside furnace without the need for a Bunsen burner.
- System should carry a warranty of 12 Months from the date of installation
- System should be supplied with 3 Years AMC after completion of Standard One year Warranty

NOTE: The Specifications quoted by the Firms must match with the University requirements.