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**Request for Quotation (REVISED ON 27 JULY, 2018)**

Enquiry No: IITK/CE/TG/NCAP2018-02

original Date: 25, June 2018

Revised Date: 27, July 2018

**REVISED Last Date: 6<sup>th</sup> Aug (MONDAY), 2018**

**PLEASE NOTE THAT THE EMD FEE OF INR5,75,000 (FIVE LAKH SEVENTY THOUSAND) NEEDS TO BE PAID ALONG WITH THE TECHNICAL BID. A BANK DEMAND DRAFT IN FAVOR “REGISTRAR, IIT KANPUR” CAN BE ALSO ATTACHED INSIDE THE SEALED ENVELOP.**

**Technical bid tender opening date will be communicated to participating vendors.**

**Financial bid for the technically qualified parties will be opened at a later stage.**

**Sub: Call for quotation for “GCMS with Autosampler, Headspace, TD and Automated Solvent extraction and evaporation system”**

Sealed quotations are invited for purchase of **GCMS with Autosampler, Headspace, TD and Automated Solvent extraction and evaporation system**. Supplier should mention complete contact details such as E-mail, telephone etc.

**Minimum Technical Specifications:**

The goal is to analyze mainly following and similar compounds from ambient PM<sub>2.5</sub> collected over 47 mm quartz filter substrates: 2,3-dihydroxy-4-oxopentanoic acid, phthalic acid and other dicarboxylic acids, 4-methylphthalic acid, levoglucosan, mannosan, galactosan, and n-hopanes, dicarboxylic acids, Poly aromatic hydrocarbons (16 USEPA priority PAHS), 4-hydroxy-3-nitrobenzyl alcohol etc. The suppliers must quote entire setup including fully automated sample preparation unit and accessories needed to run the system for above mentioned compounds. The instrument and all its sub-units should operate on 230 ± 10 volts, 50 Hz power supply.

Sr. No.	Item	Description
1	Gas Chromatograph	Oven should have large capacity to accommodate two columns with maximum temperature range up to 450 °C with set point resolution of 0.1°C. It should support 15 ramps or better with MS & maximum temperature ramp rate of 120° C/min or better. Cool down of Oven from 450°C to 50°C in

		less than 4.5 minutes. Chromatographic performance of peak area repeatability should be <1% RSD.
2	Injectors	<ul style="list-style-type: none"> <li>• Split Splitless Injector for split, split less with fully EPC/PPC and pressure range 0.001 to 100 p.s.i or more. Maximum temperature should be 450° C or more.</li> <li>• Programmable temperature Split Splitless Injector with fully EPC /PPC and pressure range up to 100 p.s.i or more.</li> <li>• It is desirable to have Electronic pneumatic controls for injector and detector modules. The electronics carrier gas controller should allow operating in constant and programmed flow and pressure modes.</li> </ul>
3	Backflash	Should quote separate post column or mid column backflash Replacement of GC column without venting MS vacuum which results in elimination of GC/MS downtime
4	Auto Sampler/ Auto Injector	Auto Sampler with 50 or more 2ml vial capacity Area Reproducibility better than 0.4% RSD Syringe as 10µL or 100µL as standard or better Vial size : 2mL
5	Automated Headspace Sampler	<p>12 vials or more capacity of headspace sampler should be quoted Vial size : 10 &amp; 20/22ml EPC/PPC Control in Headspace Oven Temperature: upto 300 °C or more, settable in 1 °C increments The Transferline should be made of Stainless steel internally coated with inert material (SilcoNert 2000) and the transfer line temperature should be upto 300 °C or more, settable in 1 °C increments</p> <ul style="list-style-type: none"> <li>• Priority vials and sequences should be available</li> <li>• Vial pressurization modes: Standard, Pressure, Flow, Volume.</li> <li>• Loop fill modes: Standard, Pressure, Custom. All are fully controlled by the auxiliary gas electronic flow control on the unit</li> <li>• Purging: Automated purging of vent and sample paths, fully controlled by the auxiliary gas electronic flow control on the unit. User-selectable settings for time and purge flow</li> <li>• Typical area repeatability: &lt;1% RSD</li> </ul>
6	Automated Sample Extraction System	Accelerated sample preparation technique shall be capable of oven temperature control up to 200 °C and cell pressure at 1500 psi. Extractor should have optional facility of PC control through a dedicated software. Fully automated Solvent Extraction System with integrated Solvent Controller and sequential capability of extracting atleast 12 or more solid / semisolid samples carousel / cups mounting unattended with typical extraction times of 15 minutes or less. One extra set of 12 carousel must be provided. Using common solvents at elevated temperature and pressure for faster extraction

		<p>process. Instrument should be valid for Organic as well as Inorganic extraction.</p> <ul style="list-style-type: none"> <li>• Solvent controller and automatic filtration system facility.</li> <li>• Oven: Temperature ambient to 200 °C or more and Pressure delivery upto 1500 psi or more.</li> <li>• Sensors facility for monitoring temperature, pressure or solvent leaks</li> <li>• Collection bottles of 20 ml or more are to be provided along with Collection bottle tray capable of holding more than more than 12 positions sample with minimum</li> <li>• 3 sets to be provided</li> <li>• Extraction Cells: 3 sets of extraction cells / cups to be offered.</li> <li>• Integrated solvent controller permitting use of 6 or more solvents</li> <li>• System should be able to load, extract, cool the solvent and filter the same in collecting tubes automatically. No need of manual filtration.</li> <li>• The system should have acid or basic resistant tubing in solvent flow path with corrosion resistant extraction cell/ cups</li> <li>• Sensors for temperature, pressure, and solvent and liquid leaks to alert the operator if there is a problem, sound an audible alarm, and automatic shut down the system if necessary.</li> <li>• Standard accessories like caps, filters, fittings, vials / cups should be provided with the system. (each of the accessories at least for 3000 samples)</li> <li>• Any other accessories and consumables required for processing at least 3000 samples should be provided</li> <li>• Convenient front panel operation runs, methods automatically on up to 20 or more samples /methods</li> <li>• Should comply with USEPA methods</li> <li>• Extractor should have optional facility of PC control through the software</li> <li>• System must be supplied with suitable fume hood Exhaust system</li> <li>• Any consumables for at least 500 sample runs should be provided</li> </ul>
7	Sample Evaporator	<ul style="list-style-type: none"> <li>• The evaporator should be like Rocket evaporator or equivalent or better.</li> <li>• The evaporation system shall use centrifugation combined with vacuum and low temperatures with precise temperature control to run unattended .</li> <li>• The solvent recovery system shall have a chiller that uses a 2-stage cold trap with the ability to use up to six 250-mL evaporation flasks and shall</li> </ul>

		<p>accommodate up to 18 ASE® 60-mL vials or better.</p> <ul style="list-style-type: none"> <li>The evaporation system shall have a solvent recovery system that will recover 80-90% of solvents.</li> </ul>
8	Mass Spectrometer detector and analyzer	<p>Noncoated EI source with maximum temperature of 350° C or better. Higher temp will be preferred.</p> <p>Dual Filament and Dual-stage mass filter with off-axis ion guide pre-filter for noise reduction and solid, homogeneous non-coated quadrupole rods or suitable technology</p> <p>Electron energy up to 200 ev or better</p> <p>The detector should be new generation discrete dynode electron multiplier or equivalent.</p> <p>Electrical dynamic range &gt; 10<sup>7</sup> or better</p> <p>The Transferline (for GC-MS interface) temperature should be programmable up to 350 °C or more.</p> <p>Mass resolution of unit Mass</p>
9	Mass Range	Up to 1000 amu or better
10	Scan Rate	Scan rate of 20000 amu/sec or better
11	Sensitivity	<ul style="list-style-type: none"> <li>EI scan sensitivity 1500:1 or better, by 1 micro liter injection of 1pg/ul OFN standard scanning from 50 to 300 amu at nominal 272 or better.</li> <li>EI SIM Instrument detection limit of 10 fg or better using 100 fg / µl OFN standard at nominal 272 m/z ion should be demonstrated at site when scanning 50–300 amu with 30 m x 0.25 mm x 0.25 µm column or better.</li> </ul>
12	Turbo Molecular Pump	Single turbo molecular pump with capacity of 250L/sec or more.
13	Library	Latest NIST library with license version as well as Fiehn MS library with license version and Fiehn standard kit.
14	Software	Original software with license to control GC-MS and other accessories. It should come with free of cost upgradation facility as and when up upgraded by the company and life-time validity for qualitative and quantitative data evaluation. Software should be capable of automatic peak and spectra deconvolution of partially coeluting compounds. Software should have reporting capability including QA/QC templates.
15	Warranty	5 Years standard comprehensive warranty including adequate number of regular on-site service visits (2 or more annual) and equal number of breakdown annual site-visits. All site visits during the warranty period should be covered by the company at their own expense. Unlimited telephone and remote support for instrument diagnostics and troubleshooting for the instrument lifetime should be provided.
16	Accessories	<ul style="list-style-type: none"> <li>Capillary Columns HP-5, 30-meter length</li> <li>Capillary Column for PAH analysis : 2 qty</li> <li>Capillary Columns for VOC analysis DB624 or equivalent: 2 qty</li> <li>DB-5 column equivalent to USP phase G27 (30mx0.25mmx0.25µm)</li> <li>CP-Sil 8CB (for aromatics) (30mx0.25mmx0.25µm)</li> </ul>

		<ul style="list-style-type: none"> <li>• WAX column or equivalent (30mx0.25mmx0.25µm)</li> <li>• Snoop, 8 oz (236 mL) bottle</li> <li>• brass nut and ferrule set 30/pk</li> <li>• Copper tubing</li> <li>• tee, brass 4/pk</li> <li>• Tubing cutter,</li> <li>• Nut driver</li> <li>• Screwdriver : 2 qty</li> <li>• Open end wrench</li> <li>• Wrench</li> <li>• Helium and Nitrogen Gas Cylinder with double stage regulators and cage.</li> <li>• Gas Purification Panel</li> <li>• 2 mL Vials with Cap and Septa: 1000</li> <li>• EI Filament: 4</li> <li>• Mass Tuning/Calibration Solution – Qty 1</li> <li>• Autosampler Syringe 10µl capacity – Qty 4</li> <li>• 20/22ml vial with cap &amp; septa – Qty 1000</li> <li>• Manual crimper &amp; decapper – each Qty 1</li> <li>• Liner Sealing Ring for programmable Injector – Qty 10</li> <li>• Liner for Injectors split, splitless and programmable mode: 10 each</li> <li>• Graphite Ferrule for inlet and detectors: 100</li> <li>• Inlet septa: 500 no.</li> <li>• 10 µl syringes: 10 no.</li> <li>• Nuts for inlet and detectors: 50 nos. each</li> <li>• RP oil: 5L</li> </ul>
17	Thermal desorber	<p>Equivalent to Ultra-xr (Markes international) or better.</p> <ul style="list-style-type: none"> <li>• A high-throughput, automated thermal desorption system for the rapid and unattended processing of up to 100 sample sorbent tubes in a single sequence.</li> <li>• Trap heating rate 100°C/s or more</li> <li>• Single and double splitting options with &lt;1.0% carryover or better.</li> <li>• Control by Software allows automated, unattended sequencing of tube.</li> <li>• Temperature range: Primary desorption and Trap high temperature 40°C to 400°C,</li> <li>• Sample flow path 50°C to 200°C. or better.</li> <li>• Pneumatics pressure control upto 60 psi or better.</li> </ul> <p><b><u>Consumables for Thermal desorption system:</u></b></p> <ul style="list-style-type: none"> <li>• Cold Trap, TO-15/TO-17 air toxic, Unity 2: Quantity 2 No.</li> <li>• Cold Trap, General Purpose: Quantity 2 No.</li> <li>• O-Rings, 7mm Cold Trap Seals: Quantity 30 No.</li> <li>• O-Rings, 6mm Cold Trap Seals: Quantity 30 No.</li> <li>• PTFE Filter disks, 5.1mm: Quantity 50 No.</li> <li>• PTFE Filter disks, 6.3mm: Quantity 50No.</li> <li>• Quick fit connectors: Quantity 20 No.</li> </ul>

		<ul style="list-style-type: none"> <li>• Stainless steel difflok cap: Quantity 50 No.</li> <li>• empty stst tubes: Quantity 100 No.</li> <li>• empty glass tubes: Quantity 200 No.</li> <li>• loose fit PTFE inserts for direct desorption of materials: Quantity 100 No.</li> <li>• long term tube storage caps: Quantity 100 No.</li> <li>• Spare PTFE ferrules for TD storage caps: Quantity 60 No.</li> </ul>
18	Other items	<ul style="list-style-type: none"> <li>• Any other accessory for smooth running and operation.</li> <li>• 10 KVA UPS with 60 mins backup with a rack/cage for securing batteries.</li> <li>• List of previous installations (min 5 at educational institutes, with complete details) with performance certificate is a <b>MUST</b>.</li> <li>• Windows MS based PC Workstation with preloaded software from the manufacturer compatible with data acquisition and analysis. The system should satisfy the following minimum specification</li> <li>• Compatible i5 PC or better with Window 7 or better (1 TB HDD, 8 GB RAM)</li> <li>• Laser Jet color Printer.</li> <li>• Free onsite training during installation and then again at the application's lab site for 2 person.</li> </ul>
19	Performance/application notes of interest	Company's application team should provide details of application note describing the measurement of following compounds in aerosol samples and clearly highlighting the role of various hardware and accessories required for the complete quantitative analysis: 2,3-dihydroxy-4-oxopentanoic acid, phthalic acid and other dicarboxylic acids, 4-methylphthalic acid, levoglucosan, mannosan, galactosan, and n-hopanes, dicarboxylic acids, Poly aromatic hydrocarbons (16 USEPA priority PAHS), 4-hydroxy-3-nitrobenzyl alcohol
20	Standards	Standards for 16 PAHs, dicarboxylic acids, levoglucosan, hopanes and other organic compounds listed previously from NIST for minimum 500 sample runs should be provided.

**The suppliers MUST provide technical specification compliance sheet mentioning part number and proper references by quoting page number, web link, application note etc. in a remark column.**

**Terms and Conditions under bulk Tendering for MOEFCC funded NCAP:**

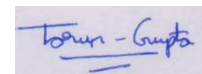
- Quote should be made in two parts: Technical bid and financial bid separately in sealed envelopes.
- Financial bid for products whose technical bid is not acceptable will not be opened.
- If the financial bid is included in the technical bid then quotation will be rejected.
- The sealed envelopes with the quotes should be super scribed mentioning whether it is technical or financial bid.
- Taxes, packaging, forwarding freight charges, if any should be mentioned separately and clearly.
- The GC-MS with accessories is proposed to be procured under a consortium agreement of various participating Govt. Institutes to ensure standardization and to avail volume discounts.

- The consortium appointed tendering institute (IIT Kanpur) may negotiate with the lowest and responsive bidder for justification of prices and discounts.
- The bidders are required to deliver the GC-MS with accessories in the following 3 institutes:
  - a) IIT Kanpur, Kalyanpur, Uttar Pradesh, 208016 (PI: Prof. Tarun Gupta, Dept. Of Civil Engineering)
  - b) IIT Delhi, Hauz Khas, New Delhi, Delhi, 110016 (PI: Prof. Gazala Habib, Dept. of Civil Engineering)
  - c) IISER Bhopal, Bhopal Bypass Road, Bhauri, Bhopal, Madhya Pradesh 462066 (PI: Prof. Ramya Sunder Raman, Dept. of Earth & Environmental Sciences)
- Maximum educational discount, if any, should be offered.
- The participating institutes may place separate orders for supply of Item(s) as per their individual requirements on same rates, terms and conditions but with separate purchase orders, point of delivery, customs clearance, delivery and payment arrangements.
- The bidders are required to quote their lowest rates and discounts for different quantities i.e. Qty.-3, Qty.-2 and Qty.-1. The rates are to be mentioned separately. The order will be placed on rates applicable for a particular quantity finalized at the time of placing the order. **The quotes should be valid for 180 days.**
- **5 years extended comprehensive warranty from the date of installation on all the parts of GC-MS including spares and accessories is a must.**
- The rates for GST (SGST,IGST,CGST) whichever is applicable, must be mentioned separately for IISER Bhopal (Madhya Pradesh), IIT Kanpur (Uttar Pradesh), IIT Delhi(New delhi).
- The bidder must certify that installation, training and any other charges quoted for IIT Kanpur will remain same for all other participating Institutes and nothing extra will be charged towards these heads.
- Uniform rate will apply even if any institute (s) requires re-tendering a single item.
- One authorized representative of each of the bidder (may come at their own expenses) would be permitted to be present at the time of opening of the technical bids. **Technical bid tender opening date will be communicated to participating vendors.**
- All quotations should be in the currency of the country of origin of the instrument and on FOB/FCA basis only.
- Quotation should carry proper certifications like Authorization, Proprietary Certificate, USEPA Certificate etc.
- Institute is exempted for payment of Excise Duty under notification no. 10/97 and partially @ 5.15% custom duty exemption certificate under notification 51/96 and road permit will be provided if applicable.
- The penalty @ 1% per week or part thereof subject to a maximum of 10% of the delivery price will be deducted from the balance payment if supply is not completed within stipulated time period.
- Our standard payment terms & conditions is 90% against delivery and 10% after inspection and approval of its satisfactory performance.
- At any time prior to the deadline for submission of bids, IIT Kanpur may, for any reason, whether on its own initiative or in response to the clarification sought by a prospective BIDDER may modify the bid document by issuing necessary corrigendum.
- The institute reserves the right for accepting and rejecting any quotations without assigning any reason thereof.
- **REVISED Last Date: 6<sup>th</sup> Aug (MONDAY), 2018**
- **PLEASE NOTE THAT THE EMD FEE OF INR5,75,000 (FIVE LAKH SEVENTY THOUSAND) NEEDS TO BE PAID ALONG WITH THE TECHNICAL BID. A BANK DEMAND DRAFT IN FAVOR "REGISTRAR, IIT KANPUR" CAN BE ALSO ATTACHED INSIDE THE SEALED ENVELOP.**

Thanking You!

Date: July 27<sup>th</sup>, 2018

Yours faithfully,



Dr. Tarun Gupta  
Professor  
Department of Civil Engineering  
Indian Institute of Technology Kanpur