File Ref. No. PUR/IICT/0503/24-25/EQPT **Dt: 18-07-2024**
CPPP Tender ID : 2024_CSIR_200823_1

Minutes of Pre-Bid Conference (PBC) held on 18-07-2024 for proposed procurement of **"Supply, installation and commissioning of "CHEMISORPTION ANALYZER WITH Q-MASS DETECTOR FOR MULTI GAS ANALYSIS"**

Chairpersons / Members of the Technical Sub Committee (TSC) present during PBC including domain expertspresent during PBC:-

1. Dr. Pratyay Basak Chairman
2. Dr. N. Lingaiah,Member/PL
3. Dr. G.Jithender Reddy, Member
4. Sri. D. Venkateswara Rao, Member
5. Dr. Sreepriya Vedantam, Member
6. Dr. G.H. Gunasekar (IO)

Representatives of the following firm attended the PBC:

1. M/s Partech Scientific Instruments, Mumbai
2. M/s Verder Scientific Pvt. Ltd., Hyderabad
3. M/s Anton Parr India Pvt. Ltd., Hyderabad

The following points were discussed during the PBC:

Query raised by M/s. Partech Scientific Instruments, and response of CSIR-IICT:

There is no query against our tender specifications

Query raised by M/s. Verder Scientific Pvt. Ltd, and response of CSIR-IICT:

Query-1: The Analyser should have fail-safe safety features for furnace should include safety lock for instrument door and also a safety lock for furnace door
Response: The committee cleared that the safety of the instrument was included in the tender specifications

Query-2: Vapor dosing system should include a constant temperature air bath to avoid condensation of the generated vapours with appropriate temperature control.
Response: There is no change in specifications

Query-3: The Vapor dosing system should have facility to control concentration & pressure of the generated vapor using an in-built Peltier condenser or similar mechanism.
Response: There is no change in specifications

Query-4: Sample tubes must be attached to replaceable filters to prevent particulate matter of the sample (example low-density materials like Carbon) entry into analysis system to avoid contamination / blockages.
Response: Since it is related to instrument safety, the committee is agreed to incorporate in the tender specifications.

Query-5: It should be possible and easy for the operator to change and clean the sample tube dust filters without calling the service personnel. The system should be supplied with 20 set of filters as standard supply.
Response: The committee is agreed to incorporate 20 filters//frits in the spares list

Query-6: The pulse loop for gas sampling for must be of variable capacity and the pulse loop must have an associated temperature and pressure sensor for accurate gas sampling.
Response: There is no change in specifications

Query-7: The system should be equipped with an in-built gas mixing unit, for accurate gas mixing in any proportion arbitrarily, eliminating the need for pre-mixed gas cylinders, prepares on-line gas mixtures by using pure gas cylinders.
Response: There is no change in the specification

Query raised by M/s. Anton Parr India Pvt. Ltd, and response of CSIR-IICT:

Query-1: It is requested to reduce gas ports to minimum 4 numbers including pre-treatment, analysis and carrier.
Response: The committee is responded that the instrument should have minimum eight gas inlets ports.

Query-2: It is requested to keep one MFCs for chemisorption studies.
Response: The committee is responded that the instrument should have minimum three inbuilt MFCs

Query-3: The furnace designed temperature of 1200°C and working temperature of 1100°C should be changed in the tender specification as 1100 and 1000°C, respectively.
Response: The committee is not agreed to change the furnace temperature ranges.

The committee is suggested to incorporate the following points:

1. **Inlet ports & MFCs:** The system should have minimum three inbuilt MFCs, at least one MFC should be resistance for corrosive gases.
2. **Furnace:** The furnace minimum ramp rate should be changed to 2°C from 1°C.
3. **Filters/Frits:** The system should be equipped suitable filters/frits to prevent the solid particles entry into analysis stream to avoid contamination and blockages. The filters/frits should be easily accessible to user for regular cleaning/changing.
4. The system should be equipped to carryout N_2O pulse chemisorption to estimate the Cu dispersion.

5.**Q-Mas:** A bench top standalone quadrupole type mass spectrometer of 1-200 a.m.u. detection limit with independent software which should be capable to integrate with chemisorption analyzer and vapour phase reactors.

6. **Essential accessories:** 20 numbers of filters/frits were included

7. **Warranty**: Comprehensive warranty for the whole system should be for a minimum of 3 years from the date of successful installation/performance certificate

Points clarified by CSIR-IICT Team during PBC:

The representatives of the participating firm/further informed that they do not have any issue or suggestion with respect to other points of tendered specifications and related requirements given in the tender document. Participating bidders have been informed that points raised by them during PBC will be examined by CSIR-IICT's **Technical Sub Committee (TSC)/Technical team** constituted for the purpose of procurement of said equipment and **post PBC changes** in tendered specifications and requirements to be agreed after due consideration of the same by TSC, **if any**, will be uploaded in **CPPP** as part of **revised/amended tendered specifications** along with CSIR-IICT website www.iict.res.in on or before 22.07.24. All bidders are requested kindly to take a note of the changes, if any, in tendered specifications subsequent to **PBC** held today, i.e. 18-07-2024 before they start submitting their online bids through CPPP.

(Dr N Lingaiah)
Member/PL

(Dr Jithender Reddy)
Member

(Dr. Sreepriya Vedantam)
Member

(Sri. D. Venkateswara Rao)
Member

(Dr. G.H. Gunasekar)
IO

19/07/2024

(Dr. Pratyay Basak)
Chairperson

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Revised Technical Specifications of Chemisorption Analyzer with Q-Mass Detector after PBC

A fully automated chemisorption analyzer combined with quadrupole mass detector for temperature programmed reduction, desorption, and oxidation (TPR/TPD/TPO) and pulse chemisorption to evaluate the surface properties of solid catalysts such as acidity/basicity, reduction profiles, metal dispersion, metallic surface area and particle size.

1. Analyses: The system should be capable to carry out the following analysis.

(i) Temperature programmed reduction (TPR); (ii) Temperature programmed desorption (TPD); (iii). Temperature programmed oxidation (TPO); (iv) Pulse chemisorption for metals like Co, Cu, Ni, Pt and Pd - particularly, the system should be equipped to carryout N_2O pulse chemisorption to estimate the Cu dispersion.

2. Detector: The instrument should have equipped with Thermal Conductivity Detector, which can detect the change in thermal conductivity of gases like O_2, N_2, NH_3, H_2, N_2O, CO, and CO_2 with respective to concentration from the gas inlet ports.

3. Inlet ports & MFCs: There should be at least built-in 8 or more gas inlet ports including preparation/pretreatment, carrier and analysis/measurement. The gas inlet portsshould be resistant to corrosive gases. The system should have minimum three MFCs in which at least one MFC should be resistant to corrosive gases. Gas flow through in-built MFCs must be precise and accurate flow control for preparation/pretreatment and measurements.

4. Furnace: The furnace should be reach up to 1100 °C with ramp rate from 2 °C per minute to 50 °C per minute and should hold at this temperature for at least 1 hour with a precision of $\pm$ 1°C. The maximum design temperature should be 1200 °C. The quick cooling facility should be integrated internally in the main equipment either by external gas connection or inbuilt fan for cooling. There should a provision for Cryocool facility for future up-gradation.

5. Sample tube: Fused quartz sample tube for use up to 1100 °C or better in a single split tube furnace. A K-type thermocouple should be provided in the catalyst bed with sheath material compatible with the applied corrosive gases. There should be suitable filters/frits to prevent the solid particles entry into analysis stream from sample tube to avoid contamination and blockages. The filters/frits should be easily accessible to user for regular cleaning/changing.

6. Vapor dosing: Vapor dosing facility for producing vapors of pyridine, H_2O, C_2H_5OH along with vapor injection port should be provided. Also, the system should avoid condensation of the generated vapors.

7. Moisture trap port: System should have a moisture trap with suitable adsorbent as required by the TPR measurements

8. Integration with Q- Mass unit: A bench top standalone quadrupole type mass spectrometer of 1-200 a.m.u. detection limit with independent software which should be capable to integrate with chemisorption analyzer.

9. Software: Total control through PC (i7 or better, 10th generation or better, monitor 24 inches or above, preinstalled MS office, 16 GB RAM or better, 1 TB SSD or better, key board, mouse) using windows 10 or above-based software having data analysis, data reduction, reporting, data deconvolution, etc., Calibration routines are to be controlled by the software. Features for creating methods, programming heating rates, hold-up times, gas composition, internal calibration, etc., with a wide range of utility features should be available. The software should have all the data handling features like user-defined report generation, data/figures export facility, offline data processing, historical data trending and logging, and scientific databases (standard) necessary for analyzing the obtained information from the instrument. Also, it should includea multi function laser printer (duplex printing). There should be an independent software for quadrupole mass analyzer which should be capable to integrate with chemisorption analyzer and vapor phase reactors.

Any subsequent software up gradation as and when latest version released by vendor or compatible with the latest version of windows released by Microsoft from vendor side should be provided free of cost for at least next 10 years.

10. Reference standards: Calibration standards or reference materials for pulse chemisorptions, TPR and TPD should be included in the offer.

11. Essential accessories: The system should be provided with suitable quartz sample tubes (50 Nos.) to accommodate various catalyst volumes and sizes for use up to 1100 °C. Also, fuses spare set, septa, chemically resistant O-rings must be provided as spares (50 Nos. each) including tool kit, cleaning accessories and filters/frits (20 nos.) should be provided. Digital flow meter and snoop solutions must be provided. Service manuals for operation, maintenance, software, circuit diagram and flow diagram in print and soft copy format should be provided.

12. Warranty: Comprehensive warranty for the whole system should be for a minimum of 3 years from the date of successful installation/performance certificate. Consumables and other spare parts for at least 3 years of operation should be provided. The quoted model should be valid for further at least 10 years in terms of spares/accessories etc.

13. Safety: All safety features should be included for fail-safe operation of the equipment including interlocks for protection from overheating, gas safety and other electrical safety options.

14. Training: The supplier must provide installation, commission, and on-site training for the

user group, from operating the instrument to complete structure determination/solution, general maintenance and troubleshooting without any additional cost.

15. Other requirements: The supplier should provide prompt service support within 72 hours of complaint. The firm should also provide the user list for the same instrument with contact details within India Govt./ Private Organizations. Point wise compliance sheet with brochure/ catalogue/ data sheet of the quoted model is to be provided. Any other absolutely essential accessories for the proper functioning/ operationof the equipment which is not mentioned above should be included in the offer.

(Dr N Lingaiah)
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(Dr. Pratyay Basak)
Chairperson