

INDIAN ASSOCIATION FOR THE CULTIVATION OF SCIENCE  
2A & B, RAJA S.C.MULLICK ROAD  
JADAVPUR, KOLKATA -700032

TENDER NOTICE NO. DST/SR/S1/IC-61A/2012/AB/MS/13/25 dated 17.06.2013

Sealed tenders in two bids system (Technical Bid & Financial Bid) are invited from bonafide, resourceful and eligible manufacturers/exclusive distributors for "TPD/TPR/TPO analyzer"

**Part - I** (Technical Bid) of the tender should contain technical details and commercial terms and conditions and **Part-II** (Price Bid) should indicate group-wise price as mentioned in the Technical Bid where applicable. The Technical Bid and Price bid are to be submitted in two separately sealed envelopes distinctly marked accordingly and both to be put inside another envelope, which should be sealed and superscribed with tender notice no. and due date. The bidders may submit bids duly signed in their own letterheads.

Complete tender should reach the office of the Department of Materials Science, Indian Association for the Cultivation of Science, 2A & B Raja S. C. Mullick Road, Jadavpur, Kolkata-700032 on or before scheduled date & time specified below.

Tender Notice No.	DST/SR/S1/IC-61A/2012/AB/MS/13/25 dated 17.06.2013
Last date and time of submitting tender	12 <sup>th</sup> July , 2013 at 1.00 P.M.
Pre-bid meeting	26th June, 2013 at 3.00 P.M.
Date and time of opening tender	12 <sup>th</sup> July, 2013 at 3.00 P.M.
Place of opening tender	S.N.Bose Hall, IACS,Kolkata
Contact	e-mail:msab@iacs.res.in Tel. +91-33-2473 4971 (ext. 1207)

The technical bids will be opened first to evaluate the technical specifications of the equipment

thereafter, the **Price bids** of only technically qualified bidders will be opened.

**Technical Bid Evaluation:** The Technical Bids will be evaluated in the presence of the representatives of intending bidders who will be able to clarify technical aspects of their bids, if any, required by the Technical Evaluation Team.

**Opening of price-bid:** The Price Bids of the bidders qualifying the technical bid will only be opened, the date of which will be intimated to the short-listed bidders at their email addresses. The rest of the bids will be rejected.

Please note that IACS will not provide any accommodation or expenses to any of the bidders for attending opening of technical bid.

#### 1. TECHNICAL BID:

The Technical Bid should contain technical specifications and kept in a separate envelope duly super scribed as "**Technical Bid**" on the outer side of the envelope as detailed above.

The Technical Specifications acceptable for the  
"TPD/TPR/TPO analyzer"  
are as follows:

### **Specifications for TPD/TPR/TPO analyzer:**

The system must be fully automated for the characterization of the nature of the catalyst surface with automated gas flow methods and analysis sequences should be programmed using software. It should have facility for titrations for metal area and dispersion determination.

Instrument should have automatic loop injector and automatic gas switching. It should have furnace temperature ramping facility for temperature programmed methods and sample preparation, should have rapid furnace cooling using forced air or equivalent for higher throughput.

System should have TCD detector - both oxidation and ammonia resistant, with stable current control for baseline stability and reproducible signals and should be plumbed in stainless-steel for maximum chemical compatibility.

System should have facility to use wide-range of gases. High-temperature quartz sample cells should be supplied with the system.

TPR/TPD/TPO facility should be available in the system,

#### **a) TPD (Temperature Programmed Desorption)**

To determine the distribution of acid-site strength if ammonia is the sorbed gas, or the distribution of basic sites if carbon dioxide is the sorbed gas.

#### **b) TPR (Temperature Programmed Reduction Reaction)**

Furnace temperature should be up to 1100 °C.

#### **c) TPO (Temperature Programmed Oxidation Reaction)**

Should be performed in an analogous manner to evaluate a sample's ease of oxidation.

System should have Pulse Titration technique to automatically determine the following quantitative data:

- (i) strong chemisorption uptake,
- (ii) active metal area,
- (iii) metal dispersion and
- (iv) crystallite size (average size of metal particles).

System should have BET Surface Area Analysis Facility:

For a single-point BET analysis.

Supplier should quote Optional Quadrupole Mass Spectrometer, and an external digital gas blender/mass flow controller.

Instrument should have 2 Sample Stations: one analysis + one preparation.

Titration Loop: Automatic - 50, 100 & 250 µl loops provided (other sizes optional)

Gas Inputs: 5 (automatic switching of four plus calibration/ titration gas)

Sample Cell: Quartz U-tube for high-temperature chemisorption, quartz or borosilicate (Pyrex®) conventional cell for physisorption (BET surface area analysis).

Chemisorption Gases: Typically H<sub>2</sub>, O<sub>2</sub>, CO, NO, SO<sub>2</sub>, NH<sub>3</sub>

Physisorption Gases: Typically N<sub>2</sub>, Ar, Kr, CO<sub>2</sub> in helium

TPR/TPD Heating Rates: 1°C min<sup>-1</sup> to 100 °C min<sup>-1</sup> (up to 500°C)

1°C min<sup>-1</sup> to 50°C min<sup>-1</sup> (up to 750°C)

1°C min<sup>-1</sup> to 30°C min<sup>-1</sup> (up to 1000°C)

1°C min<sup>-1</sup> to 20°C min<sup>-1</sup> (up to 1100°C)

Furnace Control: Via software.

Sample Thermocouple: Inside sample cell

Furnace Cooling Rate: 1000°C to 100°C : <30 minutes

System should be supplied with all required accessories to run the instrument which includes,

1) PC and Printer

2) Gas Cylinders with Two Stage gas regulators together with gas flow control panel.

3) Liquid Nitrogen Container

4) Gas ferrules and fitting

Supplier should have supplied same type of 10 Instruments in India.

**User List:** The supplier should provide a list of current users (with contact no, Email address etc) for the quoted item in India.

**Service facility:** Trained technicians should install the instrument and ensure it is operating correctly and within specifications. User training at site should also be provided. Supplier should mention their details of service setup that are responsible for after sales support.

## 2. PRICE BID:

The financial bid indicating (item-wise) price for the item(s) mentioned in the technical bid should be kept in a separate sealed envelope duly super scribed as "PRICE BID" on the outer cover of the envelope as already detailed above. The price bids of only technically qualified bidders will be opened and they will be

intimated the date and time of opening of price bids at their email id-(s). Rest of the bids will stand rejected.

**PRICE:** Price to be quoted both on FOB/CIF basis. Name of the particular port from where our authorized forwarder will lift the consignment must be mentioned clearly with FOB price.

**BID SECURITY:**

1. The financial bid should be super scribed as **"PRICE BID'** on the outer cover of the envelope
2. **Bid Security (EMD):** An Account Payee Demand Draft of Rs.40,000/- in the name of **"Indian Association for the Cultivation of Science"** is to be furnished by the bidders, as Bid Security money or Earnest Money Deposit (EMD).
3. The Demand Draft for the Bid-Security money should have at least 45(forty five) days validity period after the opening of the Bids.
4. In case of non-award of the work the Bid Security money would be returned to the unsuccessful Bidders.

**PERFORMANCE SECURITY:**

An Account Payee Demand Draft of an amount of **10% of the order value** in the name of **"Indian Association for the Cultivation of Science"** is to be furnished by the successful bidder as Performance security. Performance security money should remain valid for a period of 60 days beyond the date of completion of all contractual obligations of the supplier including warranty obligations. Bid security money will be refunded to successful bidder on receipt of the Performance security money.

**GENERAL INSTRUCTIONS:**

1. Incomplete & conditional tenders and tenders received after the due date will be summarily rejected without assigning any reasons thereof. **"TPD/TPR/TPO analyzer"** should clearly be written on the envelope.
2. At any time prior to the bid due date, IACS may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective bidder during pre-bid meeting, modify the bidding documents. The

amendment(s) will be notified on the Institute website. Prospective bidders are advised to occasionally visit the website ([www.iacs.res.in/tender](http://www.iacs.res.in/tender)) for any amendment.

3. **Payment:** 100% against delivery and successful installation subject to submission of performance guarantee.

4. **Warranty:** Minimum 5 years.

5. **Installation/Demonstration/Application Training at site:** Free of cost by the supplier.

6. **Service facility:** Supplier should mention their details of service setup and Manpower in Kolkata who are responsible for after sales support. Response time should be within 24 hours.

7. **Validity of tender:** Tender submitted shall remain valid at least for three months from the date of opening of the tender. Validity beyond four months from the date of opening of the tender shall be by mutual consent.

8. The tender should accompany a compliance chart.

9. The rate should be inclusive of all taxes, transportation etc. Nothing extra will be paid in addition to the quoted rate.

10. The model number, make, and a printed literature of the product shall be submitted positively.

11. Proposed delivery schedule should be mentioned clearly.

12. Manufacturers/exclusive distributors/vendors should have history of supplying this type of instrument to this or other Scientific Organizations.

13. Authorized Dealership Certificate is must in case of principal manufacturing company is not quoting directly.

14. Guarantee certificate, users manuals etc. are to be handed over to the user after successful commissioning of the system.

15. In the event of date being declared a closed holiday for purchaser's office, the due date for submission of bids and opening of technical bids will be the following working day at the appointed time.

16. In case of any dispute, the decision of the Institute authority shall be final and binding on the bidders.

17. For any clarification regarding technical specifications etc. please send your queries to "Prof. Asim Bhaumik" at [msab@iacs.res.in](mailto:msab@iacs.res.in).

18. The Institute reserves the right to reject any or all of the tenders received without assigning any reason thereof.

**Registrar**