INDIAN INSTITUTE OF TECHNOLOGY KANPUR Tel.: +91 512 259 7697/7895
Department of Chemical Engineering E-mail:srisiva@iitk.ac.in

Enquiry No.: 34/CHE/SSK
Enquiry Date: June 10, 2015
Closing Date: June 17, 2015

Sealed quotation(s) in Indian Rupees or USD with all technical details so as to reach latest by 3:00 PM on June 17, 2015 are invited for the supply of following items.

Note: Price Bid and Technical bid of each instrument should be provided separately with same date and also mention the enquiry number and instrument name on the sealed envelope carrying the quotation.

Particle size measurement with Dynamic light scattering principle and Zeta Potential

Specifications for Particle size measurement with Dynamic light scattering principle and Zeta Potential:

- Measurement principle: The instruments should measure particle size in Nano range with DLS (Dynamic light scattering) principle as per ISO 13321 or ISO 22412.
- Correlator: High sensitive corrector with minimum 1024 channels or above.
- Temperature control range: 0 deg. C to 90 deg. C
- The Instrument should perform particle size zeta potential and Molecular weight measurements in a single measuring unit. The range, accuracy and principle of operation for particle size, molecular weight and zeta potential are as follows:

- Particle Size:
  - Measured range : 1nm to 4.0 microns or above
  - Measured principle : Dynamic light scattering
  - Sample Concentration Range: 0.00l% wlv to cover all research oriented w/v concentrations (up to 5% w/v).
  - Minimum sample volume : 20 microliter
  - Accuracy : better than +/- 2% of NIST traceable latex standards
  - Precision/repeatability : better than +/- 2% on NIST traceable latex standards

- Zeta Potential:
  - Measured range: +/- 300mV
  - Size Range for Zeta Potential: 5 nm to 30 microns or above.
  - Measured Principle : Electrophoretic light scattering and should be capable to measure both Aqueous/Polar Solvents and Oils, High Salts/ Non-Polar solvents based systems. It should use the method of Phase Analysis Light Scattering (PALS) to improve the repeatability of measurements of low mobility samples
  - Minimum sample volume : 750 microlitre
  - Maximum sample conductivity : 300 mS/cm
  - Disposable cells should be quoted to remove any cross contamination.

- Molecular Weight:
  - Measured range : 10,000 Da to 2x107 Da
  - Measured principle : Static light scattering using Debye plot or using Dynamic Light Scattering.
  - Minimum sample volume : 20 microlitre

1. General

  - Power requirements: 240V, 50 HZ
  - Operating environment temperature : 20-35 degree C
  - Operating environment humidity – 40 to 90%
  - Should be free from any vibration

2. Laser source

- Type: Low Power He Ne Laser
- Wavelength in nanometers: 653nm or lower

3. Detector/detector electronics

- Type: Avalanche Photo Diode with highest sensitivity for size measurements.

4. Output

- For particle size : differential/cumulative distributions; values for sizes at given percentages, fits to distribution models
- For zeta potential : plot of zeta potential distribution, mean zeta value
- For molecular weight: mean molecular weight value.

5. Software

- The software should be Windows XP/Window 7 based. It should provide result such as particle size, zeta potential measurement and Molecular Weight determination.
- The software should have in built diagnostic features like Size Quality Report and Zeta Quality Report with the ability to provide expert advice based on the rate data that has been accumulated. The raw data should be available later for analysis & use with other software modules.

6. Computer

- Processor type : Intel Core i5 Processor, 4 GB RAM
- Memory size : 250 GB HD, CD-ROM or DVD + RW drive, USB port
- Operating system; Windows XP pro, Windows Vista or Windows 7 Professional (32 bit and 64 bit)
- Monitor type : Wide Screen Monitor
- Software supports for the equipment

7. Accessories:

Together with the instrument following parts and consumables should be supplied:

- NIST tracable special particle size standard.
- Disposable Zeta potential measurement cells with gold/platinum or equivalent plated electrode.-- -- 10 nos.
- 1 pieces of 12 mm square quartz cell for particle size & Molecular Weight measurements.
- 100 nos. of 12 mm square disposable polystyrene sample cell.
- Zeta potential traceable standard.
- Solid Surface Charge Measurement Cell: Optional Cell for measuring solid surface charge (eg nano coatings, thin films etc.)
- Low volume Quartz cell (min vol 20ul)– 1 piece

8. Optional Accessories:

Vendor to quote for the following as optional items:

- Autotitrator: Optional Autotitrator to automate the measurement of size and zeta potential as a firnction of pH, conductivity or additive concentration.
- Upgradeable for flow mode operation with SEC to enable connection of 1 or 2 external detectors & a remote measurement start. The optics must be fully pre-aligned with no user adjustment required.

10. Mandatory Requirement: INSTALLATION & COMMISSIONING:

The vendor should supply list of installation (minimum l0) in India of the same model quoted against this enquiry. Installation & commissioning of the test facility shall be done by the supplier at our site. Training to our R&D personnel on operation of the system to be imparted by the supplier.

The machine should be duly certified / authorized and the vendor should produce the certificate for the same.

Terms & Conditions:

I. Price Bid and Technical bid should be provided separately with same date.
II. Prices (FOB/ High Sea Sales) should include delivery up to nearest airport.
III. Clearly state the CIF charges to IIT Kanpur and other taxes as applicable.
IV. Warranty should at least be for 1-3 years after installation.
V. Validity of quotation should be at least for 90 days.
VI. The delivery time should be clearly mentioned. Shorter delivery time may be given a preference.
VII. Technical specifications along with the extent of compliance should be in a separate envelope with proper labels on the envelopes.
VIII. The delivery period should be specifically stated.

Kindly mention the enquiry number on the sealed envelope carrying the quotation.

The quotation/s may be submitted as per the attached format. Kindly send the sealed quotation(s) to the following address:

Dr. Sri Sivakumar
Department of Chemical Engineering
Indian Institute of Technology Kanpur 208016
Kanpur, U.P., INDIA
Phone No. +91-512-259 7697/7895