

8-October-11

Ref: IITD/BCHE/Stores/PLN03/BCHE/2011-2012/goniometer

Sub: Minutes of meeting to decide the technical specifications of Goniometer

The purchase committee met at 12.00 Hours on 20th September 2011 to decide the technical specifications of video based contact angle goniometer. The committee members decided the following technical specifications and terms and conditions for the NIQ.

Technical Specifications of Contact angle Goniometer:

- 1) Software controlled measurement of contact angle of sessile liquid drops
 - a) The sample stage size of at least 90mm x 90mm (L x W)
 - b) Manual movement of sample stage in both the lateral directions as well as in vertical direction.
 - c) Measuring range of contact angle should be 0 to 180^o with a video precision of 0.1^o or better.
 - d) Three automated and one manual dosing syringe.
- 2) Software controlled drop shape analysis of pendant drops to measure interfacial tension
 - a) Facility to measure interfacial tension between two liquids including drop of lighter liquid in heavier liquid.
 - b) Facility to analyze gas bubbles in liquid
 - c) Software controlled dosing syringes
 - d) Software to determine surface free energy
- 3) Software controlled measurement of Interfacial dynamics of surfactants by expanding and oscillating drop methods.
 - a) Temperature range 10-50^oC
 - b) Frequency : 0-50 Hz
 - c) Continuous amplitude control
 - d) Capable of generating linear, sine, sawtooth, rectangle, triangle and arbitrary waveforms.
 - e) Pressure accuracy : +/-12 Pa

- 4) Software to calculate adsorption, Gibbs elasticity, adsorption length, area per molecule, energy of adsorption, interaction energy, between adsorbed molecules, the relaxation time and surface tension, dynamic surface tension upon area deformation.
- 5) Video System including camera:
 - a) Digital camera with minimum resolution of 780 x 580 pixels at least 60 fps and at least 300 fps at 780 x 60 pixels along with all necessary lenses, hardware, connections and software.
 - b) Optical magnification should be 7x or better.
- 6) Temperature control in the range -30 to 160⁰C
- 7) Air to Water recirculating chiller for temperature in the range 5 to 40⁰C
- 8) Essential accessories: Cuvettes, Syringes, Needles and others as required to carry out the functions described in the above mentioned points 1 to 3
- 9) Possibility of Integration with following features:
 - a) Software controlled movement of sample stage in lateral as well as vertical directions
 - b) Software controlled tilting stage
 - c) Facility to measure contact angle from top view of the drop
 - d) Ultra high speed camera
 - e) Humidity control chamber
 - f) Rheological properties at interfaces of spherical drops by means of drop shape analysis and pressure measurement
- 10) Performance of the equipment and vendor
 - a) The performance and claimed specifications of the instrument should be explained using some proven example systems. Published literature in peer reviewed journals of international repute may be used for this purpose.
 - b) A list of the users of such instrument preferably in India and feedback from them should be included in the technical bid. Proven record of after sales service and support should be attached. The purchase committee may visit any previous installation of the equipment by the company to get first-hand knowledge of the performance.

Terms and Conditions

1. Letter from the manufacturer specifically to quote for this tender is to be attached with the technical quotation for authenticity of dealership/agency.
2. Sealed quotations in separate envelopes of Technical and Commercial bids kept in one sealed outer envelope should be submitted

3. Special discount/ rebate wherever admissible keeping in view that the supplies made for educational purposes in respect of the public institution of national importance may please be indicated.
4. Taxes, terms and conditions should be clearly mentioned. The rates quoted must be *CIF Delhi price as well as FOB*.
5. Payment terms and conditions should be clearly mentioned. No advance payment is encouraged by IIT Delhi.
6. The Institute/ purchase committee has the right to accept or reject any bid or all quotations without assigning any reason whatsoever.
7. The claims made about the equipment should be verifiable when installed in our laboratory and your installation expert must show that the claimed specifications are all met, failing which the machine will not be accepted.
8. Appropriate training should be given to one person of IIT Delhi at installation site. All the necessary technical support should be provided to maintain the instrument at our site, which may be required from time to time, due its use over a period of time.
9. Commitment for extended periods of such support at IIT Delhi for not less than three to four years beyond the warranty period is expected. The vendor should provide the details of his service strengths to maintain and/or trouble shoot or provide service to this equipment, in order to reduce the machine down time.
10. The technical bid should contain compliance statement vis-à-vis specifications in a “tabular form” clearly stating the compliance and giving justification, supported by technical literature with clear reference of page number, paragraph or lines. This statement must be signed, with the company seal, by the tendered for its authenticity and acceptance that any incorrect or ambiguous information found submitted will result in disqualification of the tender. The quotation should be complete in all respects (as per IIT-Delhi rules).
11. Sealed quotations in separate envelopes of Technical and Commercial bids kept in one sealed outer envelope (super-scribed “Quotation for **Goniometer**”) should be addressed to Head of Department Attn: Dr. Sudip K. Pattanayek, Department of Chemical Engineering, Indian Institute of Technology, Hauz Khas, New Delhi 110016, INDIA and should reach by 5.00pm on **November 11, 2011**

Prof. S.S. Veeravalli

Prof. A.N. Bhaskarwar

Prof. Rajesh Khanna

Dr. S. K. Pattanayek