

Dear Sir,

Kindly send a quote for the following item on CIP Bangalore basis. Your quotation should clearly indicate the terms of delivery, delivery schedule, E.D., payment terms etc. The tender should be submitted in two separate sealed envelopes - one containing the technical bid and the other containing the commercial bid, both of which should reach us, duly signed on or before 1700 hours, 24<sup>th</sup> April 2017.

**Please enclose a compliance certificate for all the items including mass spectrometer, interface, electrochemical cells etc. along with the technical bid.**

Yours Sincerely,

P S Anil Kumar  
Department of Physics

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### **Differential *Electrochemical* Mass Spectrometer (DEMS)**

- Combination of electrochemical half-cell with mass spectrometry allowing *in-situ*, mass resolved observation of gaseous or volatile electrochemical reactants / intermediates and/or products. Analytical instrument for *in situ* measurements of products based on carbon dioxide reduction, water electrolysis, lithium-air batteries, fuel cells etc.
- The DEMS instrument should consist of an electrochemical cell that is interfaced to a differentially pumped vacuum system containing a quadrupole mass spectrometer. There should be a microporous membrane interface.
- Time and potential resolved correlation of species based on mass ion and current in the electrochemical cell.

The quote for the instrument must consist of three crucial components.

- Quadrupole mass spectrometer with differentially pumped vacuum system. Turbo molecular pump - with back up pump to create vacuum at the inlet.
- Interface (membrane) - Vacuum flange with frit supporting the porous membrane (PTFE, for example).
- Electrochemical half-cell – Any available cell should be given with the specification on the volume of the electrolyte to be used / area of the electrodes that could be used in the cell. Two cells are required. Electrodes are to be provided as well. The cells should be for batteries / fuel cell and electrochemical studies such as carbon dioxide reduction and methanol oxidation.
- Solvent capture system before the inlet (could be based on Peltier effect).
- Suitable tubing

- \$ The cell volume should be small of the order of few mL of electrolyte.
- \$ Additionally, thin layer cell with provision for very small volume should also be provided.

Mass range ~ 300 amu

Detector – Electron multiplier

Flow meters – one for reference gas and another for analyte

**Terms and conditions:**

1. The vendor should have a track record of having previously supplied similar equipment in India (please furnish details).
2. The vendor should have qualified technical service personnel for servicing the equipment.
3. The payment will be through confirmed irrevocable Letter of Credit.
4. The lead time for the delivery of the equipment should not be more than two months from the date of receipt of our purchase order.
5. The instrument must carry a comprehensive warranty of 3 years (for all the parts) from the date of installation.
6. Validity to be three months minimum
7. Mode of shipment – air freight to be mentioned