

Bhurendra Singh
Deputy Registrar (S&P)

CORRIGENDUM

Tender Notice No. F5(863)ST/MNIT/CHEM/2019/I

The due date of opening of tender for “**BET surface Area Analyzer (Physical + Chemical)**” which was scheduled to be opened on 19.03.2021 has further been extended upto **05.04.2021 (Monday)**. The tender can be submitted till 02.00 PM on **05.04.2021** and the same will be opened on the same day at 3.00 PM and following amendments are hereby amendment in NIQ for details visit: www.mnit.ac.in and <https://eprocure.gov.in/epublish/app>

Before Amendment	After Amendment
<p>The instrument should be capable of carrying out following analyses on three samples simultaneously:</p> <ul style="list-style-type: none">• Single point and multi points BET/ Langmuir Surface area• Total pore volume at a pre-determined pressure point• Meso-pore size distribution using well known adsorption models• High resolution micro-pore size distribution (at least two port using commonly acceptable models for N₂ and/or Argon gas)• DFT pore size and DFT surface energy analyses• Standard Vapor option on two ports	<p>The instrument should be capable of carrying out following analyses on three samples simultaneously:</p> <ul style="list-style-type: none">• Single point and multi points BET/ Langmuir Surface area• Total pore volume at a pre-determined pressure point• Meso-pore size distribution using well known adsorption models• High resolution micro-pore size distribution (at least two ports using commonly acceptable models for N₂ and/or Argon gas)• DFT pore size and DFT surface energy analyses• Standard Vapor option on two ports
<p>Hardware Features</p> <ul style="list-style-type: none">• Sample pressure (P) measurement independently using following: 0-1000 mmHg transducers individually on all the three ports 0-10 mmHg and 0-0.1 mmHg on at least two micro-pore port• Manifold dosing pressure measurement using 0-10 mmHg; and 0-1000 mmHg transducers• Pressure measurement at saturation port (P₀): Range: 0-1000 mmHg• Servo/Automatic control for dosing and evacuation.	<ul style="list-style-type: none">• Sample pressure (P) measurement independently using following: 0-1000 mmHg transducers individually on all the three ports 0-10 mmHg and 0-0.1 mmHg on at least two micro-pore port• Manifold dosing pressure measurement using 0-10 mmHg; and 0-1000 mmHg transducers• Pressure measurement at saturation port (P₀): Range: 0-1000 mmHg• Servo/Automatic control for dosing and evacuation.

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<ul style="list-style-type: none"> • Temperature control for manifold, sample ports and ambience. • At least 24-bit A/D conversion. • Cryogen level control around the sample tubes. • Dedicated port for measurement of saturation pressure in addition to three sample ports, with its dedicated 0-1000 mmHg transducer. • Vacuum system comprising of turbo-molecular drag pump in series with diaphragm pump. • Dual cold cathode/micro-pirani vacuum gauge placed near the sample port. • Integrated/In-Situ degassing for at least three samples prior to analysis with required accessories. • Manifold outgas rates less than 0.05 mm Hg per min 	<ul style="list-style-type: none"> • <u>Temperature control for manifold</u> • At least 24-bit A/D conversion. • Cryogen level control around the sample tubes. • Dedicated port for measurement of saturation pressure in addition to three sample ports, with its dedicated 0-1000 mmHg transducer. • Vacuum system comprising of turbo-molecular drag pump in series with diaphragm pump. • Dual cold cathode/micro-pirani vacuum gauge placed near the sample port. • Integrated/In-Situ degassing for at least three samples prior to analysis with required accessories.
<p>Software Features</p> <ul style="list-style-type: none"> • Four Free-Space modes - Entered, Measured, Measured Post Analysis, and Calculated. • Standard library of adsorption properties to include 30 fluids. • Software should allow automated method development to create analysis conditions, report options and degassing conditions. • Software to allow diagnostics for system monitoring and performance. • Routine event monitoring to include: Diaphragm pump life; saturation pressure; manifold out-gas rate etc. 	<p>Software Features</p> <ul style="list-style-type: none"> • Four Free-Space modes - Entered, Measured, Measured Post Analysis, and Calculated. • Standard library of adsorption properties to include 30 fluids. • Software should allow automated method development to create analysis conditions, report options and degassing conditions. • Software to allow diagnostics for system monitoring and performance. • Routine event monitoring to include: Diaphragm pump life; saturation pressure; etc.
<p>Performance</p> <ul style="list-style-type: none"> • Transducers: total eight (8 Nos.) numbers positioned as under: 	<p>Performance</p> <ul style="list-style-type: none"> • Transducers: at least eight numbers as under:

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<p>a) 0-1000 mmHg and 0-10 mmHg on manifold to measure dosing pressure;</p> <p>b) 0-10 mmHg; and 0-0.1 mmHg on one micropore sample port.</p> <p>c) 0-1000 mmHg on all the three ports.</p> <p>d) 0-1000 mmHg on saturation measurement port.</p> <ul style="list-style-type: none"> • Transducer accuracy: <ul style="list-style-type: none"> a) 0-1000 mmHg: 0.12% of reading or better b) 0-10 mmHg : 0.12% of reading or better c) 0-0.1 mmHg: 0.15% of reading or better • Vacuum system: <ul style="list-style-type: none"> a) Ultimate vacuum: 3.75×10^{-9} torr b) Pump discharge capacity: 50 L/s or better for H₂, and 60 L/s or better for N₂ • Lowest measured P/P_0: better than 10^{-8} for Nitrogen adsorptive. • Length of experiment without refilling the dewar: minimum 70 h with three sample tubes and saturation tube. 	<p>a) 0-1000 mmHg, 0-10 mmHg and 0-0.1 mmHg for micropore analysis</p> <p>b) 0-1000 mmHg for mesopore analysis</p> <p>c) 0-1000 mmHg on saturation measurement port</p> <ul style="list-style-type: none"> • Transducer accuracy: <ul style="list-style-type: none"> d) 0-1000 mmHg: 0.12% of reading or better e) 0-10 mmHg : 0.12% of reading or better f) 0-0.1 mmHg: 0.15% of reading or better • Vacuum system: <ul style="list-style-type: none"> c) Ultimate vacuum: 3.75×10^{-9} torr d) Pump discharge capacity: 50 L/s or better for H₂, and 60 L/s or better for N₂ • Lowest measured P/P_0: better than 10^{-8} for Nitrogen adsorptive. • Length of experiment without refilling the dewar: minimum 70 h with three sample tubes and saturation tube.
<p>The instrument software should be capable of generating following reports:</p> <ul style="list-style-type: none"> • Single-point multi point BET surface area/ Langmuir surface area • Adsorption isotherm • Desorption isotherms • Langmuir surface area • BJH mesopore volume and area distribution 	<p>The instrument software should be capable of generating following reports:</p> <ul style="list-style-type: none"> • Single-point multi point BET surface area/ Langmuir surface area • Adsorption isotherm • Desorption isotherms • Langmuir surface area

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<ul style="list-style-type: none"> • Total pore volume • Micropore volume • Micropore area • High resolution micropore size distribution • Mesopore size distribution using well known adsorption models • DFT pore size and DFT surface energy analyses. • Active metal area • Crystallite size • Strong and weak chemisorptions • Active metal dispersion 	<ul style="list-style-type: none"> • BJH mesopore volume and area distribution • Total pore volume • Micropore volume • Micropore area • High resolution micropore size distribution • Mesopore size distribution using well known adsorption models • DFT pore size and DFT surface energy analyses. • Active metal area • Crystallite size • Strong and weak chemisorptions • Active metal dispersion
<p>Chemisorption Features Programmable Furnace: 1 - 50 °C/min or better</p> <p>TCD detector for analysis of at least H₂/CO/CO₂ to investigate temperature dependence of adsorption or desorption process.</p> <p>Mass Flow Controller: Standard, flow up to 200 cm³/min, ± 1% of set point</p> <p>Standard External Dedicated Port: Heated port for connection of external detectors including an available Quadrapole Mass Spec</p> <p>A/D Data acquisition: at least 24 bit</p>	<p>Chemisorption Features Programmable Furnace: 1 - 50 °C/min or better</p> <p>TCD detector for analysis of at least H₂/CO/CO₂ to investigate temperature dependence of adsorption or desorption process.</p> <p><u>Mass Flow Controller: Standard flow at least 100 cm³/min, ± 1% of set point or better</u></p> <p>Standard External Dedicated Port: Heated port for connection of external detectors including an available Quadrapole Mass Spec</p> <p>A/D Data acquisition: at least 24 bit</p>
<p>Total no. of Pressure Transducers: eight numbers (8)</p> <ul style="list-style-type: none"> • Online UPS of 5 kVA with at least 2h power back up at full 	<ul style="list-style-type: none"> • Online UPS of 5 kVA with at least 2h power back up at full load - one number

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<p>load - one number</p> <ul style="list-style-type: none"> • Filled Gas Cylinders 47 Ltrs. Nitrogen - 99.999% <p align="center">Argon - 99.999% Helium - 99.999% Carbon Dioxide(CO₂)- 99.995% Hydrogen - 99.999% Oxygen - 99.999%</p> <ul style="list-style-type: none"> • Double Stage SS Regulator for above gases numbers -six • Gas Purification for Single Gas with Trap numbers -four for Gas Service:N₂, He, H₂&Ar • Gas Purification for Single Gas with numbers -two Trap for Gas Service:CO₂& O₂ • Standard Fittings like Nuts, Ferrules, Couplings etc. for Total Gas line Quantity on actual requirement basis • SS-316 1/8" OD Tubing for the identification of Gas Line Quantity on actual requirement basis 	<ul style="list-style-type: none"> • Filled Gas Cylinders 47 Ltrs. Nitrogen - 99.999% <p align="center">Argon - 99.999% Helium - 99.999% Carbon Dioxide(CO₂)- 99.995% Hydrogen - 99.999% Oxygen - 99.999%</p> <ul style="list-style-type: none"> • Double Stage SS Regulator for above gases numbers -six • Gas Purification for Single Gas with Trap numbers -four for Gas Service:N₂, He, H₂&Ar • Gas Purification for Single Gas with numbers -two Trap for Gas Service:CO₂& O₂ • Standard Fittings like Nuts, Ferrules, Couplings etc. for Total Gas line Quantity on actual requirement basis • SS-316 1/8" OD Tubing for the identification of Gas Line Quantity on actual requirement basis • LN₂ Container 35 Liters - one
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<ul style="list-style-type: none">• LN₂ Container 35 Liters - one number• All necessary accessories required to run the instrument must be included in the technical and financial bid <p>Note:</p> <ul style="list-style-type: none">➤ Warranty: 3 Years➤ The supplier/firm should also quote the comprehensive warranty separately for the period excluding the standard warranty period➤ The firm should be globally established.➤ Specifications mentioned above should be available at the website of the manufacturer.➤ User satisfaction certificate from IITs/CSIRs (at least 5 numbers) on the letter head.➤ Price should be quoted FOR, MNIT, Jaipur.	<ul style="list-style-type: none">• All necessary accessories required to run the instrument must be included in the technical and financial bid <p>Note:</p> <ul style="list-style-type: none">➤ Warranty: 3 Years➤ The supplier/firm should also quote the comprehensive warranty separately for the period excluding the standard warranty period➤ The firm should be globally established.➤ Specifications mentioned above should be available at the website of the manufacturer.➤ User satisfaction certificate from IITs/CSIRs (at least 5 numbers) on the letter head.➤ Price should be quoted FOR, MNIT, Jaipur.
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However, all other terms & conditions of our NIQ will remain unchanged

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(Store & Purchase)