THE PMI BET SORPTOMETER

BET 201 AEL

Porous Materials, Inc.

Not just products...solutions!

Description

Fully automated vacuum volumetric, gas sorption analyzer for the measurements of Pore surface area using Nitrogen for the highest accuracy.

Applications

PMI's BET Sorptometer has a multitude of applications in industries worldwide, including industrial textiles.

Principle

When clean surface is exposed to a gas, an adsorbed film forms on the surface. Adsorbed films also form on the surface of pores within a material and vapor can condense in the pores. At a constant temperature, the amount of adsorbed/condensed gas on a surface depends on the pressure of the gas. Measurement of the amount of adsorption/condensation as a function of pressure can give information on the pore structure. The PMI Sorptometers use gas adsorption/condensation to analyze pore characteristics.

Features

- Highly sensitive to provide accurate results
- Magnetically latching valves
- Automatic coolant level control with Dewar elevator and level sensor
- Furnace with digital temperature controller

Physical Adsorption

Weak van der Waal's type interaction of molecules with a pore surface leads to physical adsorption. The Brunauer, Emmett and Teller (BET) theory of physical adsorption is normally used for analysis of adsorption data to compute surface area.

$$\frac{P}{W(P_0-P)} = \frac{1}{CW_m}\frac{C-1}{CW_m}\frac{P}{P_0}$$

Where:
W = amount of adsorbed gas
W_m = amount of gas adsorbed in a monolayer
P = gas pressure
P_0= equilibrium (saturation) vapor pressure at the test temperature
C = dimensionless constant that depends on the temperature and the gas/solid system

When vapor pressure, P is low compared with P_0 ($0.05 < P/P_0 < 0.3$), the plot of $[P/W (P_0 – P)]$ verses $[P/P_0]$ is linear and the plot yields the magnitudes of C and W_m. The surface area S per unit mass, m, of the sample is computed using the cross-sectional area of the adsorbed gas molecule:

$$S = \frac{W_m N_o a}{m}$$

Where:
N_0 = Avogadro's number
a = cross – sectional area of the adsorbed gas molecule
W_m = amount of gas adsorbed in moles

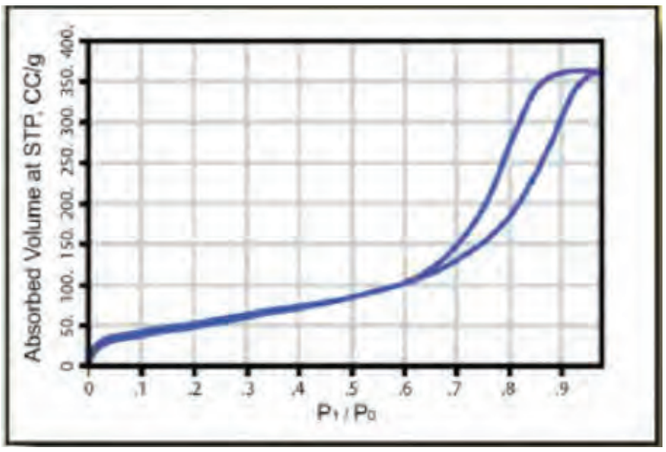

Figure 1
Adsorption and Desorption Isotherms at Liquid N_2 temperature

Specifications

- **Accuracy:** *Atleast ± 5%*
- **Sample Holder:** *Capacity More than 5ml*
- **Surface Area Range:** *0.1 m^2 and higher*
- **Reproducibility:** *Atleast ± 5%*
- **Operating Temperature:** *15°C - 40°C*
- **Regeneration System:** *a) It has a temperature range of ambient to 300°C*
  b) Accuracy of ± 5%
- **Standards:** *The equipment confirms to* **ASTM D-3037**
- *Nitrogen Purging Arrangement for sample regeneration system*

Sales & Services

Our sales team is dedicated to helping our customers find which machine is right for their situation. We also offer custom machines for customers with unique needs. To find out what we can do for you, contact us. We are committed to customer support including specific service products, short response times & customer specific solutions. To quickly & flexibly meet our customer's requirement, we oller a comprehensive range of services.

Customize your machine today!

The most advanced, accurate, easy to use and reproducable porometers in the world.

Celebrating

of solutions

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