

Liquisorb Sorptometer

Applications

The PMI Liquisorb Sorptometer has the unique ability to measure the capacity of a material for adsorption of water vapor as a function of temperature and pressure. This is an important characteristic of a variety of materials used in many industries including textiles, construction, nonwovens, biotechnology, healthcare, pharmaceutical, filtration, food, catalyst, building material, and environmental.

Principle

The clean surface of a porous material exposed to a gas forms an adsorbed film on the surface. The amount of adsorbed gas is determined by the pressure of the gas, the temperature, and the chemical nature of the gas. Gases like water vapor, ammonia, and benzene tend to interact chemically with the surface. One layer of molecules tends to get bonded to the surface and the amount of gas adsorbed tends to approach a limiting value. Chemisorption normally follows the Langmuir Equation.

$$[W / W_m] = [KP] / [1 + KP]$$

W = amount of adsorbed gas

W_m = amount of gas adsorbed in a monolayer

K = equilibrium constant

P = pressure of gas.

Operation

For investigation of the adsorption of the vapor of the desired liquid, the liquid container in the instrument is filled with the liquid. The instrument generates vapor of the liquid. The sample is degassed under vacuum at elevated temperatures. A known volume of the gas is introduced into the sample chamber and the amount of gas adsorbed is obtained from the reduction in the pressure of the gas in the sample chamber. In addition to the adsorption of water vapor, adsorption of vapors of other liquids like benzene, hexane, and acetone can also be measured.





Unique Features

- Generates vapor for testing from liquid in the reservoir
- Adsorption of vapors of liquids like water, benzene, and alcohol
- Adsorption of active chemicals like water vapor, NH₃, CO & CO₂
- Adsorption under pressures up to 500 psi
- Adsorption under extra low pressures down to 10⁻⁵ psi
- Adsorption studies at temperatures up to 300°C
- In-situ outgassing of samples under vacuum at temperatures up to 800°C.
- Fully automated and minimal operator involvement
- Windows based menu-driven procedure makes test execution, data acquisition, and data reduction very simple
- No toxic or harmful material used in the test

Specifications

Pressure Range:	10 ⁻⁶ – 10,000 torr
Pressure Transducer Range:	100 – 10,000 torr
Accuracy:	0.15 %
Resolution:	1 in 20,000
Sample Size:	Up to 1 cm in diameter
Power Requirement:	110/120 VAC, 50/60 Hz Others available
Dimensions:	66" H 24" W 24" D
Weight:	250 lbs

Other Products & Services

Porometers

- Capillary Flow Porometer
- Compression Porometer
- Cyclic Compression Porometer
- Clamp-On Porometer
- In-plane Porometer
- Microflow Porometer
- QC Porometer
- Custom Porometers
- Filter Cartridge Analyzer
- Integrity Analyzer
- Bubble Point Tester

Permeameters

- Liquid Permeameter
- Gas Permeameter
- Diffusion Permeameter
- Water Vapor Transmission Analyzer

- Envelope Surface Area Analyzer
- Average Particle Size Analyzer
- Average Fiber Diameter Analyzer

Porosimeters

- Liquid Extrusion Porosimeter
- Aquapore
- Mercury/Nonmercury Intrusion Porosimeter

BET Sorptometers

- Sorptometer
- Liquesorb Sorptometer
- Q BET

Pycnometers

- Gas Pycnometer
- Mercury Pycnometer

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Services

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