比表面積與孔隙分佈分析儀

Specific Surface Area & Pore Size Distribution Analyzer by Gas Adsorption Method

儀器設備說明：

儀器價格：2,650,000 元

儀器購置年月：2009 年 9 月

廠牌及型號：Micromeritics, ASAP2020、ASAP2010

重要規格： 利用氣體吸附法(氮氣或氬氣)量測粉體或塊材之比表面積及孔徑分佈。

儀器性能：

甲 **比表面積(Surface Area):** 報告內容為取 5 點壓力值計算之 BET & Langumir。

乙 **Pore size distribution:** Mesopore 分佈、Micropore 分佈

***Mesopore(量測範圍= 2nm~300nm) :**

報告內容 1.取 8 點壓力值計算之 BET & Langumir

2.吸脫附曲線

3. Pore size distribution (2nm~300nm)　分析模型: BJH、t-plot

***Micropore(量測範圍=0.35 nm ~300nm) :**

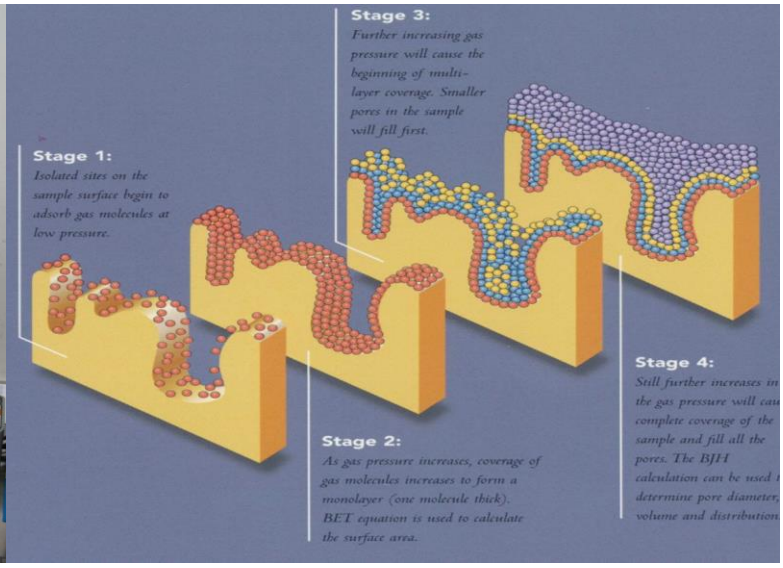
報告內容 1.取 8 點壓力值計算之 BET & Langumir

2.吸脫附曲線

3. Pore size distribution (0.35nm~300nm)

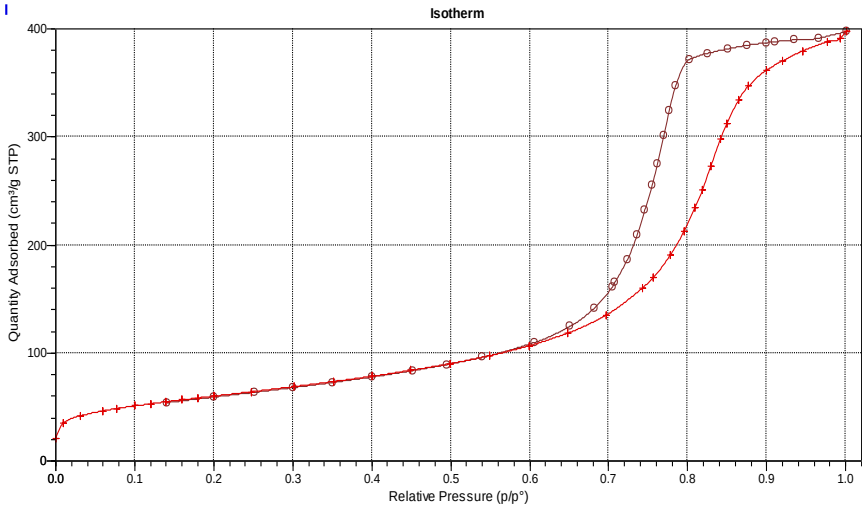
分析模型: DFT、NLDFT、HK、DA、DR、MP、BJH、t-plot

機台圖片：

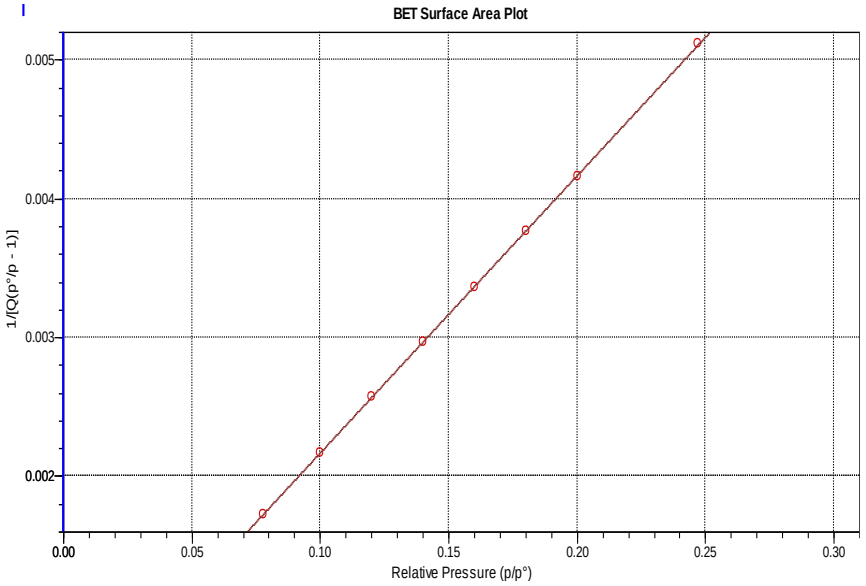


機台位置： **台灣大學 化學工程學系 粉粒體實驗室　連絡電話 (02) 3366-3010**

數據範例： Mesopore 分析

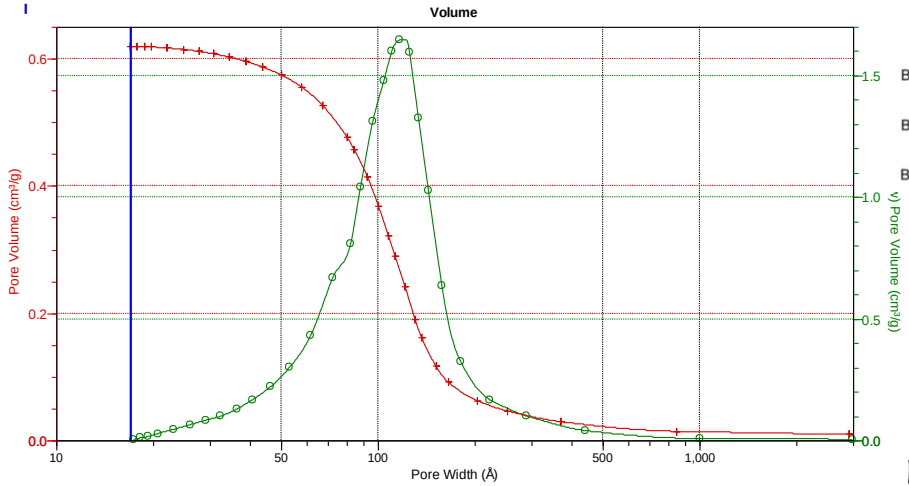


圖一、氮氣吸脫附曲線



BET Surface Area: 216.0384 ± 0.4804 m²/g
Slope: 0.019970 ± 0.000044 g/cm³ STP
Y-Intercept: 0.000178 ± 0.000007 g/cm³ STP
C: 113.500757
Qm: 49.6346 cm³/g STP
Correlation Coefficient: 0.9999853
Molecular Cross-Sectional Area: 0.1620 nm²

圖二、比表面積數據



BJH Adsorption cumulative surface area of pores
between 17.000 Å and 3,000.000 Å width: 264.637 m²/g
BJH Adsorption cumulative volume of pores
between 17.000 Å and 3,000.000 Å width: 0.620000 cm³/g
BJH Adsorption average pore width (4V/A): 93.713 Å

圖三、BJH 吸附之孔徑分佈曲線

機台應用：

Pharmaceuticals – Surface area and porosity play major roles in the ability to purify, process, blend, tablet, and package a drug substance. The useful shelf life and the dissolution rate (governing how rapidly the medicine becomes available to the body) depend upon the surface area and porosity of the material.
Ceramics – Surface area and porosity information helps to determine curing and bonding procedures, ensure adequate green strength, and produce a final product of desired strength, texture, appearance, and density.
Activated Carbons – Surface area and porosity must be optimized within narrow ranges to properly accomplish gasoline vapor recovery in automobiles, solvent recovery in painting operations, or pollution controls in wastewater management.
Carbon Black – Tire manufacturers have discovered that the surface area of carbons affects the wear lifetime, traction, and performance of tires. The intended use of the tire, or the type of vehicle on which it will be placed, determines whether low or high surface area carbons will be required.
Paints and Coatings – The surface area of the pigment or filler influences the gloss, texture, color, color saturation, brightness, solids content, and film adhesion properties. Porosity can control application properties such as fluidity, drying or setting time, and film thickness.
Catalysts – The active surface area and the porous structure of catalysts have a great influence on production rates. Limiting the pore size allows only molecules of desired sizes to enter and leave, creating a selective catalyst that will produce primarily the desired product. Chemisorption experiments are valuable for the selection of catalysts for a particular purpose, qualification of catalyst vendors, and the testing of a catalyst's performance over time to establish when the catalyst should be reactivated or replaced.
Projectile Propellant – The surface area of propellants used in the manufacture of munitions directly affects the burn rate. Too high a rate can be dangerous; too low a rate can cause malfunctions and inaccuracy.
Medical Implants – The surface area and porosity of the materials used in medical implants influence the adhesion of the material to bone or natural tissue.
Electronics – The manufacture of compact, miniature capacitors using a minimum of costly raw material requires the development of controlled, high surface area material with a carefully designed pore network.
Cosmetics – Surface area is often used by cosmetic manufacturers as a predictor of particle size when agglomeration tendencies of the fine powders make analysis with a particle-sizing instrument difficult.
Aerospace – Surface area and porosity of heat shields and insulating materials affect both weight and function.
Nanotubes – Nanotube surface area and microporosity are used to predict the capacity of a material to store hydrogen.
Fuel Cells – Fuel cell electrodes require high surface area with controlled porosity to produce optimum power density.

-此頁來源: http://www.micromeritics.com/