ASAP

Pore Size Surface Area Analysis

MATERIALS & SURFACE SCIENCE INSTITUTE

The ASAP 2010 System is an advanced surface area and porosimetry analyzer, which has the capability of routinely determining surface areas in the range 0.1 to 3000 m2 per gram of sample, and performing pore size distribution analyses for pores in the range 0.35 to 300 nanometers. Surface area and porosity are two important physical properties that determine the quality and utility of many materials. Differences in the surface area and porosity of particles within a material can greatly influence its performance characteristics. Surface area is an important property for many types of advanced materials such as nanomaterials, pharmaceutical materials, powder metallurgy materials, battery active materials, fibers, pigments, thermal spray powders, minerals, and additives. The BET method with the ASAP 2010 instrument can also be used to determine other information such as gas uptake, micropore volume (t-plot method), and pore size distribution via adsorption and desorption isotherms. The Micromeritics ASAP 2010 instrument operates by measuring gas adsorption on the sample surface.

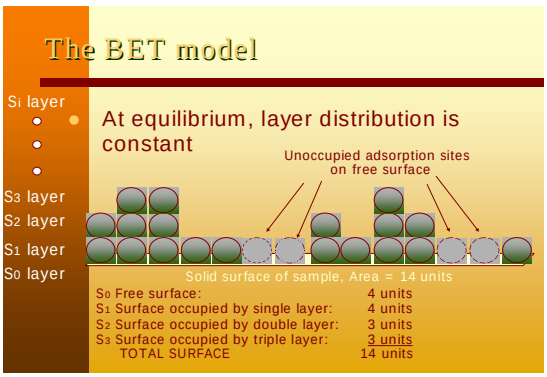

Figure 1: The BET Model illustrates distribution of three layers of molecules at equilibrium.

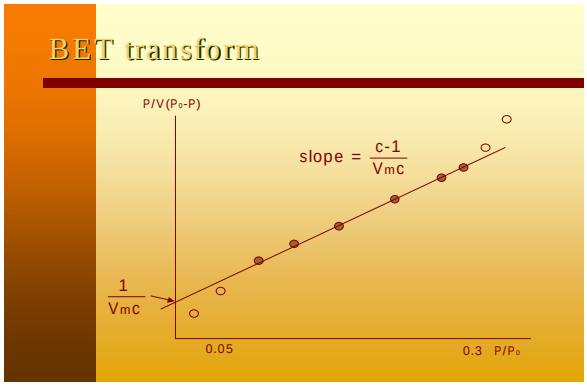

Figure 2: BET Transform shows a plot of the linear form of BET equation that allows determination of the monolayer volume Vm

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TECHNICAL SPECIFICATIONS:

The ASAP performs the following types of analysis including single-point and multipoint BET surface area, Langmuir surface area, micropore volume and area, full adsorption and desorption isotherms mesopore volume and area distributions and total pore volume. The applications that it is used for include most solid forms such as powders, pellets, granular materials, pliable composites, desiccants, zeolites, silicas. Other industrial applications include alloys, and pharmaceuticals.

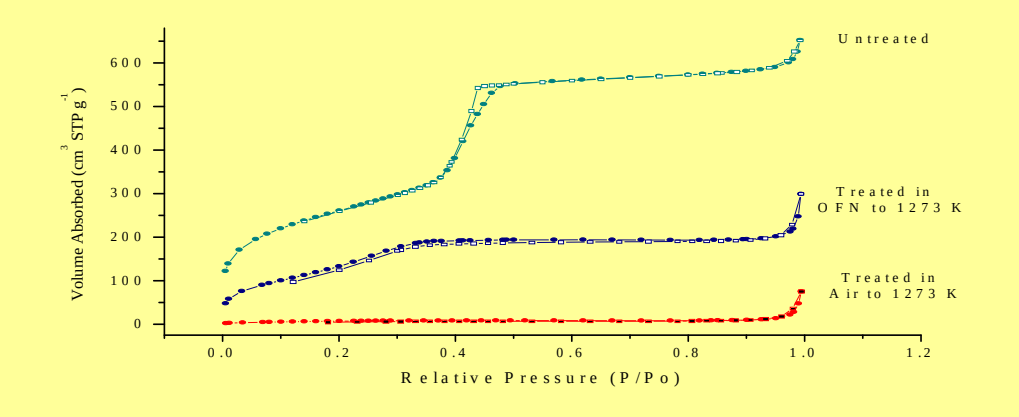

Figure 4: Full adsorption/desorption isotherm of MCM-41 (Mesoporous silicate) thermally treated in Oxygen free nitrogen and Air to temperature of 1273K.

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