Typical ASAP 2050 Applications

micromeritics®
The Science and Technology of Small Particles™

The all new, fully automated ASAP 2050 is an essential tool for measuring adsorption isotherms up to 10 atmospheres. The ASAP 2050 also allows the user to collect traditional isotherms for determining surface area and porosity.

Catalysts – Active surface area and 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.

Adsorbents for Pressure Swing Adsorption – The adsorption capacity of alkaline-exchanged zeolites is a key parameter for the design and optimization of pressure swing adsorption processes. PSA is commonly used to produce nitrogen and oxygen from air. Both the capacity and isosteric heat of adsorption are required to evaluate the performance of new materials.

Metal Hydrides – Hydrogen storage capacity is a key parameter for fuel cell systems. PEM fuel cells for vehicles may operate in the 1 - 10 atmosphere range and at temperatures ranging from 20 - 120 °C. The performance of the metal hydride is characterized by its hydrogen storage capacity (adsorption) and subsequent release (desorption) of hydrogen.

Batteries – Rechargeable nickel metal hydride (NiMH) batteries require a large hydrogen storage capacity. Increasing the hydrogen storage capacity increases the useable time for a battery. Adsorption and desorption isotherms can be used to understand the performance of NiMH in batteries.

Fuel Cells – Fuel cell electrodes require high surface area with controlled porosity to produce optimum power density.

Nanotubes – Nanotube surface area and microporosity are used to predict the capacity of a material to store hydrogen.

Activated Carbons – Surface area and porosity must be optimized within narrow ranges to accomplish properly gasoline vapor recovery in automobiles, solvent recovery in painting operations, or pollution controls in wastewater management.

Ceramics – Surface 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.

Aerospace – Surface area and porosity of heat shields and insulating materials affect both weight and function.