modern laboratories. Based on flow technique, these new instruments are fully automated, thus allowing unattended operations.

The QSurf analyzers are based on the dynamic method for the determinations of specific surface area and total pore volume in porous and nonporous materials. The gas adsorbed and desorbed by the samples under test is measured by a TCD. The sample under test is submitted to a flow (at atmospheric pressure) in a gas mixture between helium and nitrogen in different percentages. Helium is generally not adsorbed, and it is called the carrier gas. The carrier gas first flows through the reference channel of a TCD, then through the sample holder, and finally through the analytical channel of the TCD. At the start of the experiment, the sample is kept at room temperature; thus, adsorption does not take place. In this situation, the thermal conductivity of the carrier in the two TCD channels is the same, as the gas composition is the same before and after the sample. Subsequently, the system immerses the sample in a liquid nitrogen bath, cooling the sample at a very low temperature. In this condition, adsorption begins, but only nitrogen is adsorbed. Therefore, the gas composition after the sample holder is now changed, and the carrier thermal conductivity in the reference and analysis channels is different. The TCD generates a signal that is proportional to the amount of nitrogen adsorbed. When the signal returns to the starting baseline, the sample is saturated by the adsorbate at a certain partial pressure. The next step consists in removing the sample holder from the coolant. When the sample temperature rises to room temperature, the phenomenon of desorption takes place, and nitrogen is released from the sample surface. In addition, in this case, the composition of the carrier in the two TCD channels is different, because the sample is releasing the adsorbate. The TCD again generates a signal (of opposite polarity with respect to adsorption) that is proportional to the amount of gas desorbed. The Qsurf integrates the aforementioned peaks and compares the resulting integrals to a calibration peak determined previously by injecting a known dose of pure adsorbate (calibration step is performed by an automatic loop valve). The desorption peak integration thus provides the amount of gas adsorbed by the sample, and the gas mix percentage permits to calculate the partial pressure of nitrogen over the sample during the adsorption–desorption stages.

Micromeritics offers a comprehensive line of instrumentation for particle size, surface, and porosity analysis (6). The *TriStar 3000* gas adsorption analyzer is a fully automated, three-station surface area and porosimetry analyzer that delivers high-quality surface area data (and more) at an affordable price. It can increase the speed and efficiency of routine QC analyses, yet has the accuracy, resolution, and data reduction capability to meet most research requirements. Designed with the user in mind, the TriStar 3000 provides versatility in analysis methods and data reduction, allowing one to optimize analyses for a wide range of applications. The *ASAP 2020* accelerated surface area, and porosimetry analyzer uses gas sorption techniques for research and quality control applications. Also available is the chemical adsorption ("chemisorption") option, which uses the static volumetric technique to determine the percent metal dispersion, active metal surface area, the size of active particles, and the surface acidity of catalyst materials. The Micromeritics Gemini V Series of surface area analyzers rapidly and reliably produces accurate and repeatable surface area and porosity determinations of the sample material. Its simplicity of use and ruggedness have earned the Gemini its place in laboratories worldwide as an essential tool in both research and quality control environments. The *FlowSorb III*