



## CHEMISORPTION TECHNIQUE OVERVIEW

---

Chemisorption is an essential step in a catalyzed reaction, the adsorbed molecule forming an intermediate surface complex that is more receptive to chemical reaction. The dependence of catalysis on chemisorption explains why chemisorption as an analytical technique is so informative in the study of catalysis—the chemistry observed directly in the laboratory is the same as that which will occur in the final application of the catalyst.

Chemical adsorption analyses paired with physical adsorption analyses have been applied for decades as standard methods for testing catalysts. A variety of surface properties can be determined by observing the quantity of molecules participating in the adsorption and desorption processes under various, controlled conditions. As examples, chemical adsorption reveals information about the active metal surface area, surface energy, dispersion of the active metal, and size of the active particles (crystallites). Surface acidity or basicity and strength of active sites also can be determined, as well as the reducibility and oxidizability of the catalytic material. Physical adsorption is used to determine the porosity of the support material and total specific surface area of the material.