



## ASAP 2020

### TECHNIQUE OVERVIEW

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The basics of the analytical technique are simple; a sample contained in an evacuated sample tube is cooled (typically) to cryogenic temperature, then is exposed to analysis gas at a series of precisely controlled pressures. With each incremental pressure increase, the number of gas molecules adsorbed on the surface increases. The pressure at which adsorption equilibrium occurs is measured and the universal gas law is applied to determine the quantity of gas adsorbed.

As adsorption proceeds, the thickness of the adsorbed film increases. Any micropores in the surface are quickly filled, then the free surface becomes completely covered, and finally larger pores are filled. The process may continue to the point of bulk condensation of the analysis gas. Then, the desorption process may begin in which pressure systematically is reduced resulting in liberation of the adsorbed molecules. As with the adsorption process, the changing quantity of gas on the solid surface is quantified. These two sets of data describe the adsorption and desorption isotherms. Analysis of the isotherms yields information about the surface characteristics of the material.