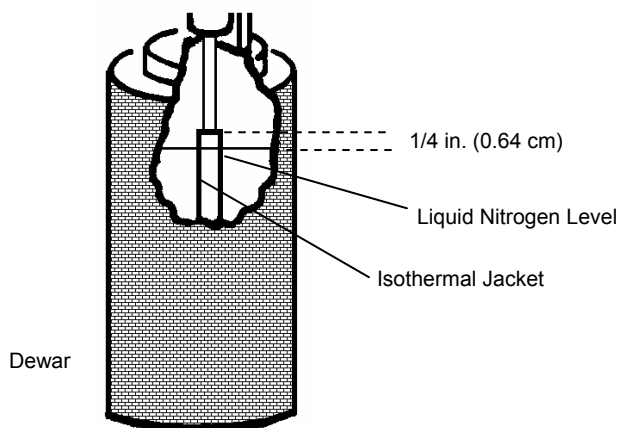


Liquid Nitrogen Level When Using Isothermal Jackets

When isothermal jackets are used, it is important not to overfill the liquid nitrogen in the Dewar. At the start of an analysis, the liquid nitrogen level should be no higher than 1/4 in. (0.64 cm) from the top of the isothermal jacket. Overfilling overrides the function of the isothermal jacket and prevents effective control of the cold zone around the sample tube throughout the analysis.

If the Dewar is filled to a level above the top of the isothermal jacket, the evaporation of the portion of LN₂ above the jacket allows the emerging sample tube to warm somewhat during the run. This causes the subsequent analysis to be somewhat in error due to the small change in gas capacity of the warmed portion.



The top of the isothermal jackets on the sample tube and on the Po tube should be at the same height. Failure to have the tops at the same height will cause a mismatch in the measured cold zones between the two tubes and will result in a small Po matching error.

In Figure 2, the liquid nitrogen level was initially above the top of the isothermal jacket. The isotherm plot rises above 130 cm³/g STP adsorbed between 0.1 and 0.2 P/Po, then declines to just slightly above 130 cm³/g STP at around 0.9 P/Po.

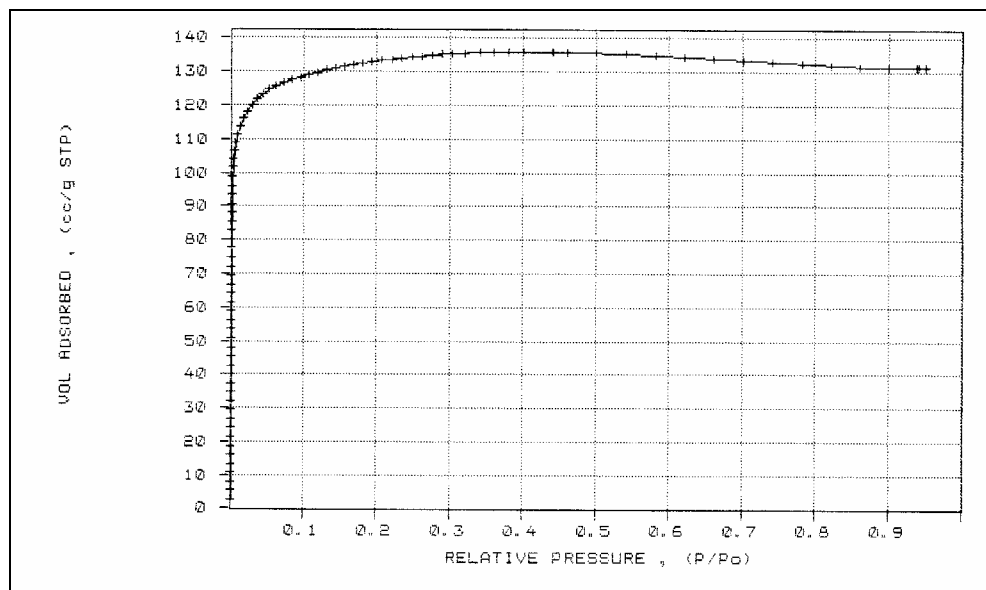


Figure 2. Isotherm Error Caused by Filling Liquid Nitrogen Dewar Above the Isothermal Jacket

Contrast this behavior with the isotherm seen in Figure 3. In this experiment, the liquid nitrogen level was kept to the recommended starting level of 1/4 in. (0.64 cm) below the top of the isothermal jacket. The isotherm seen in the resulting plot of data has the correct flat plateau.

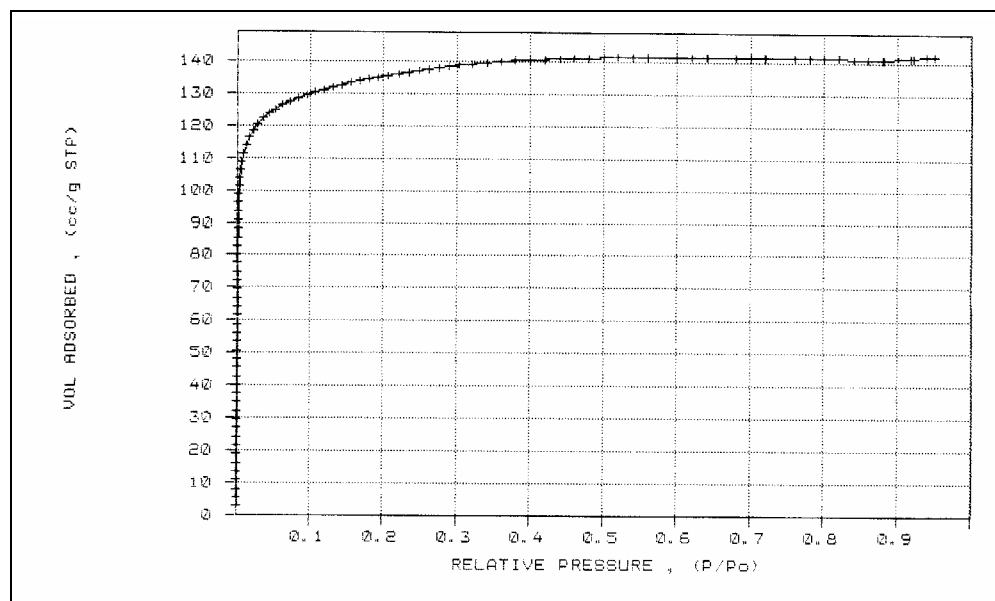


Figure 3. Normal Isotherm Produced by Filling Liquid Nitrogen Dewar to the Proper Level