Adsorption analysis of activated carbon using a magnetic suspension balance

The ad- and absorption of gases on and in solids occurs in many industrial processes. Depending on the application, this can be either a desired effect, for example in gas cleaners, or an unwanted consequence, for example the weakening of seals by carbon dioxide or hydrogen gas. Sorption is in addition strongly influenced by environmental factors such as pressure and temperature. Therefore, studies in laboratory scale are necessary to predict the behavior in real processes. The most accurate method for determining sorption behavior is by measuring mass increase through sorption on a specific sample. This can be achieved by using a magnetic suspension microbalance in combination with a gas dosing system. The goal of this module is the demonstration of an adsorption analysis on an activated carbon. A suitable measuring system consisting of a simple gas dosing system and a magnetic suspension balance is available and will be introduced as well as other systems for similar applications. The module is furthermore divided into the activation of the sample, a buoyancy measurement, the determination of single pressure points to conclude an isotherm and data processing and evaluation of the results.