The invention relates to a system employing laser for studying adsorption kinetics of an adsorbent and adsorbate pair.

**BACKGROUND**

Adsorption is the adhesion of adsorbate (atoms, ions or molecules from a gas, a liquid or a dissolved solid) to an adsorbent (surface). The adsorption kinetics deals with determining adsorbate concentration around adsorbent, adsorption rate at different temperature, pressure and concentration of adsorbate, different adsorption environment employing low and high-speed flow of adsorbate and different geometric shapes of adsorbents. Currently, adsorption kinetics is studied using various techniques which include thermogravimetry, differential scanning calorimetry and large temperature jump method. These techniques have limitations which includes non-measurement of adsorption kinetics for different configurations of adsorbent, inaccurate measurement and lack measurement on time history of adsorption.

**TECHNOLOGY**

The technology relates to a method of studying adsorption kinetics and has been tested on silica and water as adsorbent and adsorbate pair. Following are the key features of this invention:

- Adsorption kinetics can be studies at different temperature, pressure and concentration of adsorbate. It has been tested for silica gel and humid air with different configuration for silica gel particles.

- The set up can be easily modified to create different adsorption environment such as low/high speed flow of adsorbate, different configurations and geometric shapes of adsorbent.

- Measurements can be performed in a non-intrusive way using high resolution camera and diode laser to ensure best quality of result.