



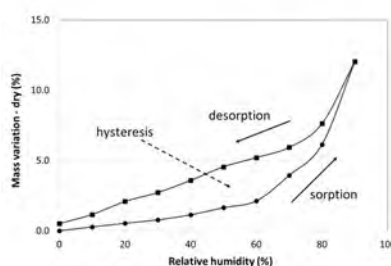
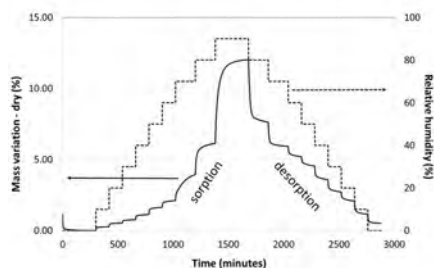
GENERAL DESCRIPTION

Dynamic vapor sorption (DVS) allows for determining the quantity of a solvent absorbed by a sample as well as the rate of uptake. This technique is based on gravimetry: a high-precision balance monitors the changes in mass of a sample resulting from the variation of its surrounding vapor concentration (or relative humidity). In comparison to a static method such as the jar method, DVS produces full results in a minimum of time.

The measurement of water sorption isotherms is carried out by exposing, at a given temperature, a sample to a series of increasing (and/or decreasing) steps of relative humidity (or water activity) and monitoring the mass change as a function of time till it stabilizes. Equilibrium mass values recorded at each humidity step produce the sorption isotherms.

Humidity ramping experiments can provide information on phase changes such as glass transition or recrystallization.

Dynamic vapor sorption



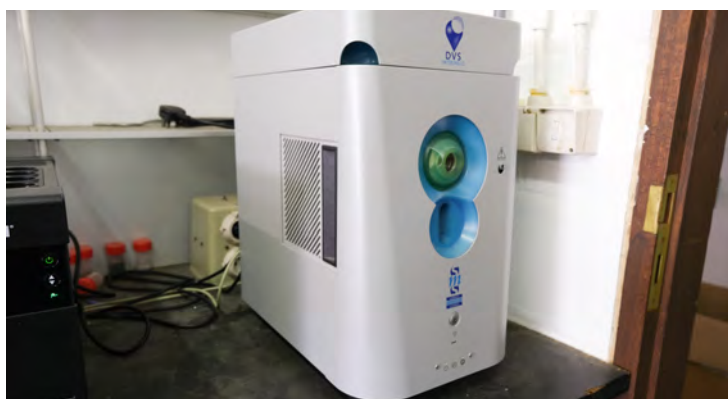
Example of a mass variation curve and corresponding isotherm plot of a mineral.

KEY-INFORMATION :

- % water uptake
- Dehydration kinetics at different temperatures
- Vapor-induced phase changes (glass transition, crystallization, deliquescence,...)
- Shelf life / Caking
- Rate of uptake / water diffusion coefficients
- Sorption mechanisms based on the shape of the hysteresis

DOMAINS OF APPLICATION

- Pharmaceuticals
- Packagings
- Food and ingredients
- Construction materials
- Cosmetics
- Grains, seeds
- Porous adsorbents
- Electronics
- Papers
- ...



REPORTING

Data treatment is performed via the DVS Standard or Advanced Analysis Suite® from Surface Measurement Systems.

A standard report will provide the most pertinent data such as the drying curve, the change in mass plot (absolute and relative), the isotherm or a change in mass-RH plot in case of a humidity ramping experiment. Optionally, hysteresis plots can be provided.

The raw data will be supplied on demand as an Excel® file.



PRACTICAL INFORMATION

- The maximum mass that can be analyzed is 1 g, with a maximum mass change of 150 mg. The resolution is 0,1 µg.
- The analyses can be carried out at a temperature between 20 and 40°C, under dry air or nitrogen. The humidity ranges between 0 and 95% R.H.
- Accurate data require the sample quantity to be chosen in accordance with its expected mass uptake (or loss) within an acceptable timespan. A few mg of sample will be sufficient for very hygroscopic materials.
- A standard analysis will be performed over a 48h period, including the drying step and predefined adsorption-desorption R.H. steps.
- Longer durations or ramping experiments adapted to your needs are also possible.
- Measurements are carried out on a Surface Measurement Systems DVS Intrinsic Low-mass/High-Resolution device.

PRICING

Contact us for a quotation adapted to your needs.