RuboSORP MSB DVS

High-Performance Dynamic Vapor Sorption using Magnetic Suspension Technology

INTRODUCTION

"Unmatched Precision in Direct Sorption Measurements"

Designed for advanced materials research, this system combines a precisely controlled environment—with wide-ranging vapor delivery, temperature flexibility, and compatibility with aggressive chemical conditions—to enable complex DVS experiments across a variety of challenging applications. The MSB design integrates effortlessly with automated vapor and temperature regulation, user-defined testing protocols, advanced data analysis, and comprehensive reporting, enhancing both workflow efficiency and experimental clarity.

What truly distinguishes MSB-based systems from traditional dynamic vapor sorption instruments is their contactless measurement principle—ensuring a stable, contamination-free environment for collecting high- quality data under real-world conditions.

VAPOR SORPTION WITH:

- ✓ **High Precision**
- ✓ **Corrosive Environments**
- ✓ **Drift Zeroing**
- ✓ **High-throughput**
- ✓ **Wide Temperature Range**

Figure 1. ***RuboSORP MSB DVS***

SIMULTANEOUS DUAL SAMPLE ANALYSIS!

KEY FEATURES

Magnetic Suspension Balance Technology:

High Sensitivity and Accuracy:
Measures weight changes with microgram precision. Magnetic suspension eliminates mechanical contact, reducing friction and wear.

Temperature Stability:
Operates reliably over wide temperature ranges (e.g., -20°C to 400°C).

Corrosion Resistance:
Ideal for working with reactive or corrosive vapors since the sample is isolated from the balance.

Advantages Over Conventional DVS Systems:

No Mechanical Wear:
Magnetic suspension eliminates the need for a conventional balance in contact with the sample.

Reduced Drift:
Long-term experiments benefit from high stability with drift correction at each data point.
Versatile Environmental Control:
Operates with a variety of gases and vapors under controlled conditions.

High-Throughput:
Runs two samples simultaneously.

BENEFITS

Over nearly four decades of refinement, magnetic suspension balances have become an essential tool across disciplines including materials science, pharmaceuticals, environmental engineering, food technology, and energy materials research. Their ability to accurately measure weight changes under varied and sometimes corrosive/harsh conditions has proven invaluable for investigating adsorption phenomena, elucidating kinetics, and determining fluid properties such as vapor pressure and density.

By employing MSB technology, the system isolates the sample from external mechanical influences, vibrations, and environmental fluctuations. This isolation results in an exceptionally stable baseline and highly sensitive mass resolution, capturing even the most subtle sorption events with reproducible precision. The hermetically sealed chamber design further ensures that sample integrity is maintained throughout the experiment, minimizing the risk of contamination and thereby yielding more reliable and representative sorption isotherms and kinetics data.

Conventional gravimetric analysis in dynamic vapor sorption (DVS) often relies on mechanical connections and traditional balances. These systems can introduce drift, frictional effects, and frequent re-calibration requirements, which may compromise measurement quality and long-term stability.

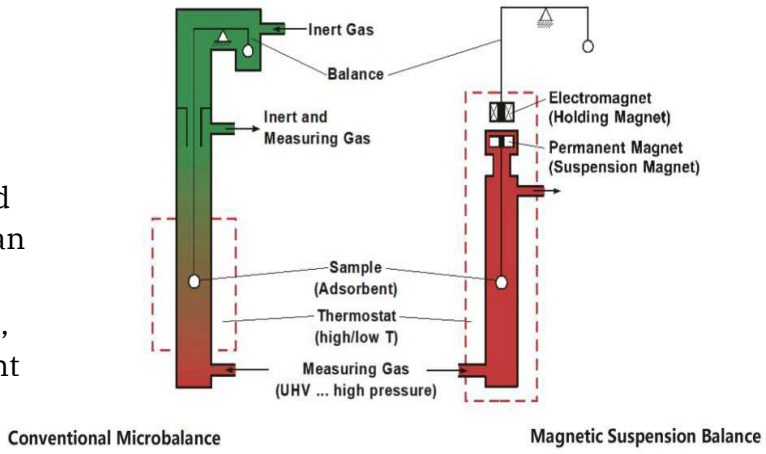

Figure 2. Comparison between conventional microbalances and magnetic suspension balance

In contrast, magnetic suspension balance technology offers a fundamentally different approach, enabling direct measurement of mass changes without mechanical contact to the sample crucible.

SCHEMATICS

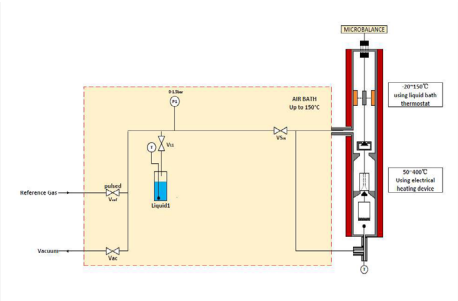

Figure 3. Vapor 10D Diagram

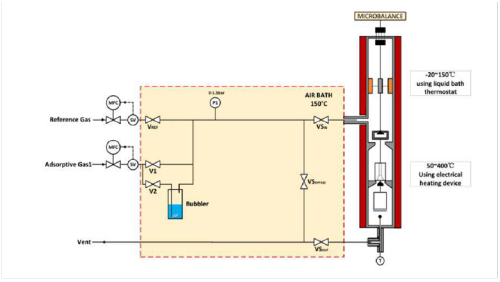

Figure 4. Vapor 10S Diagram

SPECIFICATIONS

RuboSORP MSB Vapor	Vapor-10S	Vapor-1S	Vapor-10D	Vapor-1D
Resolution	10 µg	1 µg	10 µg	1 µg
Maximum Sample Loading	15 g	5 g	15 g	5 g
Sample Throughput	2			
Pressure Range	Up to 1 bar -isotherm measurement		Ambient -dynamic gas flow	
Air Bath Temperature Control	150°C			
Temperature Range of Sample Pretreatment	Up to 400°C			
Material of Sample Crucible	Stainless steel, ceramic, or quartz			
Gas or Vapor	Water vapor, organic vapor, CO_2, corrosive gases			
Options				
Circulating Bath Thermostat	-20°C-150°C			
Additional Pressure Sensor	10 torr/1 torr/0.1 torr/Customized scale			
Multi-gas ports	Up to four (4) gas inlet ports			
High Pressure Option	10 bar			