Surface Measurement Systems
World Leader in Sorption Science

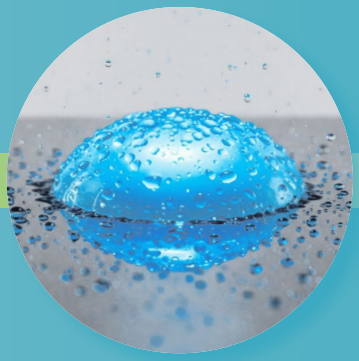
Optimize Pharmaceutical Materials Performance with Advanced Characterization Techniques

Solubility

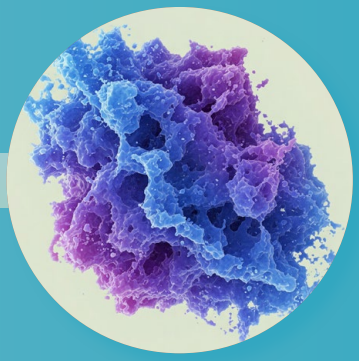
Stability

Moisture Capacity

Flowability



Hydrophobicity



Amorphous Content

Our groundbreaking instruments employ Dynamic Vapor Sorption, Inverse Gas Chromatography, & Breakthrough Analysis to provide comprehensive & precise characterization of solid-state materials, empowering research & enabling scientific breakthroughs in pharmaceutical drug development.

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Surface Measurement Systems
World Leader in Sorption Science

Empowering Material Research for World's Leading Pharmaceutical Companies

Pfizer · Roche · AstraZeneca · MERCK · NOVARTIS · GSK · Johnson&Johnson · AMGEN · abbvie · sanofi · Bristol Myers Squibb · novo nordisk

Our Instruments in Action

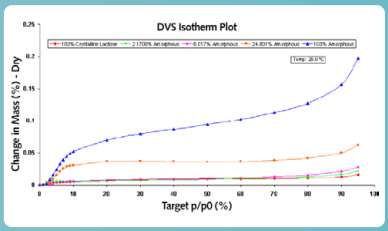
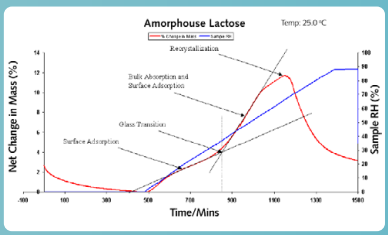


Figure 4. Octane vapor sorption isotherms for lactose samples with various amorphous fractions

Paracetemol Crystals (from Acetone Solution)	Dispersive Surface Energy (mJ/m^2) at Different Particle Sizes (µm)						
	32-75	75-125	125-150	150-250	250-425	425-600	725
Unmilled	-	31.26	30.67	30.67	31.20	32.32	32.91
Milled	41.0	39.3	39.6	37.8	37.6	34.0	-

Dispersive surface energy values for unmilled & milled paracetemol crystals grown from acetone solution at different particle size fractions



Humidity ramping experiment for amorphous lactose showing humidity induced glass transition and crystallization.

Case Study 608

The Problem: Pharma materials' stability and performance are affected by their solid-state form, requiring precise understanding of crystalline, polymorphic, and amorphous structures for effective formulation and storage.

The Techniques:
- Dynamic Vapor Sorption (DVS)
- Inverse Gas Chromatography (iGC)

The Research: Advanced sorption techniques and instrumentation were used to study the thermodynamic stability, surface energy, and moisture interaction of pharmaceutical solids. The techniques differentiated between crystalline, polymorphic, hydrated, and amorphous states by analyzing sorption behavior and retention volumes.

The Results: The thermodynamic stability of pharmaceutical materials affects all levels of formulation, process development and storage. Thermodynamic instability can range from highly ordered crystals with different polymorphs or solvates to completely amorphous materials. Vapor sorption techniques like DVS and iGC are powerful tools in the identification and characterization of these materials.

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