Surface Measurement Systems
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Going Beyond: Diving Deeper into Pharma Materials with Advanced Characterization Analysis

Wednesday 6th November

DVS Characterization of Pharmaceutical Ingredients: Beyond Water Sorption Isotherms

Dr. Dan Burnett, *Surface Measurement Systems NA*

Water sorption isotherms are common measurements for pharmaceutical ingredients and formulations. However, Dynamic Vapor Sorption (DVS) can provide a wide range of material characterization information. This webinar will highlight DVS applications beyond standard water sorption isotherms. For instance, vapor diffusion and permeability measurements can be performed on coatings and packaging materials. Additionally, DVS can be used to study vapor-induced phase transitions. Finally, hyphenation of DVS with microscopic and spectroscopic techniques can provide additional insight into how moisture interacts with pharmaceutical ingredients.

What value IGC-SEA can provide on solid-state characterization of pharmaceuticals beyond surface energy?

Dr. Anett Kondor, Surface Measurement Systems

Surface energy of the solid components in multicomponent systems are important to ensure compatibility and the strength of the intermolecular interactions. There has been increasing interest in the solid complexes of drugs with porous inorganic materials in the past decade. Their high-energy surface and polar function groups can interact with drug molecules through ionic or hydrogen bonding to stabilize the amorphous drug molecules in the pores and on the surface.

Beyond the surface energy; solubility parameter, surface Tg and hydrogen bond energy can be used to examine their influences on the miscibility and the physical stability of the amorphous systems. Modelling the physical stability of amorphous drug-polymer solid dispersions can be done by thermodynamic (focused on free energy, entropy, and enthalpy) and physicochemical (focused on chemical structure and intermolecular interactions, especially hydrogen bonding, as well as solubility parameter and many others) approaches. Both approaches complement each other.

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