Surface Measurement Systems
World Leader in Sorption Science

DVS Application Note 13

Moisture Sorption of Hydrophobic Pharmaceutical Substances

Surface Measurement Systems Ltd.

This application note describes the measurement of moisture sorption properties on two batches of a relatively hydrophobic drug, which is expected to have a maximum moisture uptake of less than 0.1%, using a DVS instrument.

Introduction

DVS is commonly employed to measure the moisture sorption properties of hygroscopic pharmaceutical materials. The affinity of these materials for the sorption of moisture is often due to a degree of amorphous character present in the material. Highly crystalline materials such as salts of drugs may have very low affinities for moisture sorption due to the low surface energy of the particles formed during the crystallisation process.

Method

The moisture sorption behaviour of two batches of a drug were analysed using a DVS instrument at 25°C over the humidity range 0-95% RH. Sample sizes of approximately 100mg were used to provide a good signal to noise ratio.

Results

Figures 1 and 2 show the kinetics of moisture sorption and sorption isotherms respectively for the two drug batches. The data demonstrates the rapidity of moisture sorption on hydrophobic samples due to the fact that the sorption kinetics are dominated by surface adsorption processes rather than bulk absorption. The isotherm data also demonstrate the excellent baseline stability and precision of the DVS instrument.

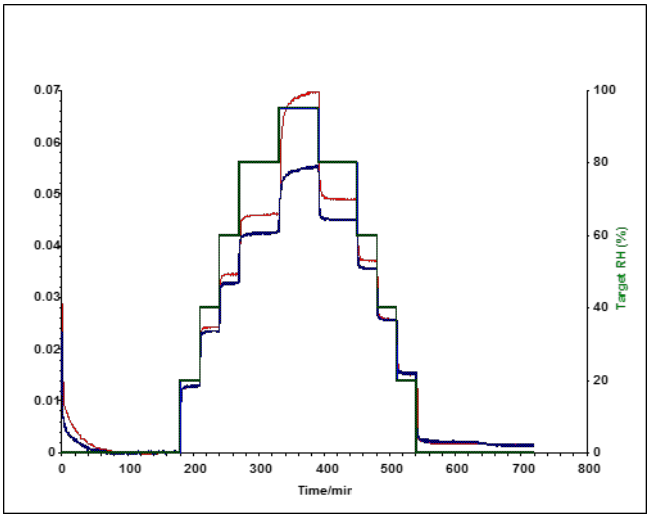

Figure 1. Moisture sorption of two batches of a relatively hydrophobic drug.





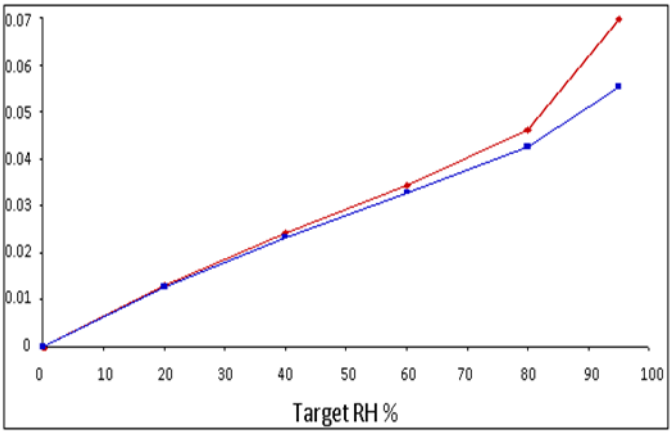

Figure 2. Moisture sorption isotherms for the two different batches.

Conclusion

DVS is able to differentiate between the moisture sorption properties of the two batches which have uptakes of 0.055% and 0.070% at 95% RH. This small difference may be due to variations in processing conditions during synthesis of the two batches of the drug.

Acknowledgement:

SMS thanks Mr. C. L. Levoguer for his contributions to the Application note.

Head Office:
Surface Measurement Systems, Ltd
5 Wharfside, Rosemont Road
LondonHA0 4PE, UK
Tel: +44 (0)20 8795 9400
Fax: +44 (0)20 8795 9401
Email: science@surfacemeasurementsystems.com

United States Office:
Surface Measurement Systems, Ltd, NA
2125 28th Street SW, Suite I
Allentown PA, 18103, USA
Tel: +1 610 798 8299
Fax: +1 610 798 0334