Studies about the Sorption/Desorption Behavior of Lactose and Starch

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ABSTRACT

Humidity has a large impact on the properties of materials (glass transition, melting behaviour, stability). It is also possible to conclude from the sorption behavior on the amorphous content of a material, which is an important issue especially for pharmaceuticals and in the food sector. To study the sorption and desorption behavior of a material, it is exposed isothermally to a certain relative humidity and the mass of the sample is recorded as a function of the time. If the mass has equilibrated the humidity is increased. Plotting the equilibrated sample mass as function of the relative humidity (which is equal to the water activity of the sample material) delivers the sorption (or desorption) isotherms.

Sorption and desorption behavior can be measured easily also by TGA. For this purpose, a TGA is interfaced with a humidity generator providing the desired gas flow at a certain humidity. At first, we explain the experimental setup and some constraints regarding the accessible temperature/humidity range of such a system. Then we discuss some measurements on amorphous lactose content and on different starch samples.

REFERENCES

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