A comparison of DSC, TMDSC and DMA techniques for studying the influence of production methods on spray dried particles.

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ABSTRACT

Since solid dosage forms are the major means of drug delivery, the form (amorphous/ crystalline) of both drug and excipient is a key factor. It is important to understand the exact nature of the amorphous phase, which is best studied via the glass transition, Tg.

Previously used DSC and TMDSC techniques will be compared with DMA, which up until now has not been possible for powder samples. Tg is measured by changes in heat capacity with the first two techniques, and by the change in modulus and relaxation time with DMA.

The work presented here considers lactose prepared using two different spray drying techniques, namely, Niro and Buchi. The DSC and TMDSC Tgs are indistinct and no difference can be seen between the materials, indeed it is hard to identify the Tg process. Results from the DMA, fitted with a simple powder holder, show a clear Tg and also differences between the two preparation methods.