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Preface

In the last fifteen years there has been a snowballing of the research undertaken in the broad arena of pharmaceuticals. This special issue of *Thermochimica Acta* consists of twenty review or original articles that concentrate on the role that thermal analysis currently plays in the characterization of pharmaceuticals. By necessity, this issue can only paint a thin veneer of the current research on the topic but nevertheless the most important, currently relevant topics are highlighted.

In its broadest context the concept of pharmaceuticals embodies the characterization of drugs and adjuncts used in the production of dosage forms, the validation of the production process, and the drug release from the dosage form and its interaction with the patient.

Thus, reviews may be found which describe the characterization of drugs, their hydrates, their polymorphs and their glassy states using the traditional methods of differential thermal analysis, differential scanning calorimetry and thermogravimetric analysis, in addition to the more recently applied methods of dynamic mechanical thermal analysis and isothermal microcalorimetry.

The solid state of a drug is fundamental to its properties such as solubility. Crystal disruption may alter the availability of the drug to the patient and therefore is also reviewed. The use of thermal analysis in the assessment of purity is a well worn subject, but chirality and chiral purity is a subject of recent concern which is reflected in a paper on ephedrine and pseudoephedrine enantiomers. Two papers specifically detailing recent research into the polymorphism and solvate formation of ibopamin and terfenadine are included. These reflect the studies which should be undertaken to solve similar solid-state conversions.

Specific articles cover recent concerns over the solid-state properties of the excipients lactose, magnesium stearate, polyethylene glycol and fatty acid suppository bases. Proteins are becoming increasingly important as drugs or delivery systems in their own right, and their thermal analysis is similarly reviewed.

Because thermal analysis is used to control either the product or the production process, spray dried products, microspheres and liposomes have been taken as examples where the application of thermal analysis is particularly pertinent to the manufacturing process.

Finally, thermal analysis has been used to examine how dosage systems perform and how drugs may more readily penetrate biological barriers before becoming available to the patient. Consequently, thermal analysis of the human skin barrier,

the thermal analysis of water in hydrogels, and the study of water uptake into matrices consisting of cellulose ethers are examined in detail.

I sincerely thank all the authors for their help and understanding in producing the papers which I think make this special issue a must for all those currently undertaking research into the thermal analysis of pharmaceuticals. They have all put in tremendous effort to produce their papers and should be rewarded by the knowledge that what they have written will help the beginners to have a baseline to commence their studies and the experts to refresh their knowledge.

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