

FOREWORD

The idea for this book arose in the summer of 2003, during the seminar on Thermal Analysis and Rheology that took place in Ferrol. Some of the lecturers and attendees agreed that it would be helpful to have a book dealing with the techniques and applications of thermal analysis, but following a similar approach to one taken in the seminar. Such a text would be helpful for beginners and experienced practitioners who just wanted to get an accurate insight and put what they learned into practice.

This book provides an overview of thermal analysis techniques. It focuses on the basic principles and looks at their application to polymers, pharmaceuticals, coals, metals and other inorganic materials. The text was conceived as a reference book and practical guide for material researchers, engineers and technologists who use thermal analysis. It also provides an academic approach for university students.

The expertise of the contributors spans several fields, including industrial R&D on polymers, instrument development and research on materials characterization. A more academic approach is given by teaching staff from the Thermal Analysis research groups of the Universities of Santiago de Compostela and Coruña, who had been involved in organising the seminar mentioned earlier.

The techniques covered in this book are DSC, M-DSC, TGA, Simultaneous DTA-TGA, Bomb Calorimetry, DEA and DMA. The contents were classified according to specific topics related to different areas of interest within thermal analysis. Therefore, apart from the chapters dedicated to the fundamentals of the different techniques, there were others devoted to specific applications: thermosets, pharmaceuticals, metals and inorganic materials, coal, evaluation of the power content of materials and viscoelastic behaviour of polymers. The chapter authored by P. Pages from the Universitat Politècnica de Catalunya exemplifies an application to material characterization where thermal analysis techniques, among others, play an important role. A final chapter was included, emphasizing how important it is to consider the mathematical treatment of thermal analysis data. This chapter introduces smoothing/fitting techniques and pattern recognition.