

Preface

Chemistry has been one of the pillars of the wealth and growth of the World economy throughout the twentieth century, based on an increasing understanding of the interactions taking place on a molecular level to enable enhanced production and product quality. Chemistry is, and will certainly continue to be, a primary driver for wellbeing, growth and sustainable development in the economy during this century.

Green(er) Chemistry is the key to sustainable development as it will lead to new solutions to existing problems and will present opportunities for new processes and products by:

- securing access to competitive feedstocks, including the exploration of alternative renewable raw materials to allow a gradual shift from petroleum-based raw materials as required;
- reducing the resource intensity of chemical manufacture and use, including closing materials loops, enhancing reuse and recycling, and reducing waste and emissions;
- developing improved and new functionalities by means of new materials and new formulations based on increasing control of physical properties from the nano to the macro scale;
- increasing control over total production costs through improving materials and energy efficiency and minimizing the impact of chemicals manufacturing on the environment;
- designing engineering solutions to allow for better product quality and fast and flexible responses to market needs.

This book aims to contribute to a better understanding of the new challenges that Chemistry is facing, with a particular emphasis on the need for the development of new processes for product separation and recovery. The contributions to this book are organized into three interlinked sections: “Green Chemistry for Sustainable Development”, “New Synthetic Methodologies and the Demand for Adequate Separation Processes” and “New Developments in Separation Processes.” The chapters from the first part present the general principles and regulations that support the need for a Green(er) Chemistry for sustainable development, while the second part will introduce novel synthetic methodologies aiming to obtain higher

quality products while respecting those principles. The third part of the book presents a comprehensive discussion of new separation processes, which result from the needs and challenges discussed in the previous sections.

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