
Preface

Modern printing is based on digitizing information, and representation of the information on a substrate, such as paper, pixel by pixel. One of the most abundant methods of digital printing is through inkjet printers. These printers are widely used in office and home, and in industrial applications such as wide format printing. Until recently, most inkjet printing was performed in graphic applications, i.e., converting conventional printing of documents into digital printing. Inkjet printing was found to be so powerful, that the method was adopted to print various functional materials, such as conductive inks, light emitting diodes (LEDs), and even three dimensional structures. A reflection of this very active field is the large number of scientific and industrial conferences which takes place every year, and the huge number of patents which are published each year. Recently, there appears to be an increasing number of scientific papers on this subject, mainly focused on printing functional materials and unique properties of the printed patterns.

The inkjet printing process is very complicated, and requires delicate tailoring of the chemical and physicochemical properties of the ink. The ink should meet the requirements which are related to storage stability, jetting performance, color management (in the case of graphic printing), wetting and adhesion on substrates. Obviously, these requirements, which represent different scientific disciplines, such as colloid chemistry, physics and chemical engineering, indicate the need for an interdisciplinary book, which will cover all aspects of making and utilizing inkjet inks.

As can be seen in the table of content, the book provides basic and essential information on the important parameters which determine the ink performance, on ink formulations, and also provides insight into novel and exciting applications based on inkjet printing of functional materials. Therefore, I hope that the book will serve the large community of industrial chemists who deal with ink formulations

and synthesis of chemicals for inks, chemical engineers and physicists which deal with rheological and flow properties of inks, as well as scientists in academic institutes who seek to develop novel applications based on inkjet printing of new materials. The various chapters of the book are written by experts from academic institutions as well as from leading companies in the field of ink formulations and raw materials manufacturing.

The first five chapters of the book focus on fundamental aspects of printing technologies, pigments and ink formulations and, and interactions of the inks with the substrates. The next six chapters focus on actual inkjet inks formulations and raw materials, by discussing the main groups of inks: waterborne, solvent-based, and UV inks. The last five chapters present unique ink systems and functional inks, such as those for obtaining 3D structures or printed electronic devices.

I would like to thank all the authors who put so much efforts to enable the publishing of this book. I also thank Dr. Vinetsky for her great help in finalizing the book, and the very professional team of World Scientific Publishing Co. Last but not least, many thanks to all my students who are performing exciting research on new materials and novel applications of inkjet printing.

Professor Shlomo Magdassi
The Hebrew University of Jerusalem, Israel
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