Surface Phenomena and Additives in Water-Based Coatings and Printing Technology

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Edited by

Mahendra K. Sharma

Eastman Kodak Company

Kingsport, Tennessee

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PREFACE

Water-based technology has undergone revolutionary changes during the past two decades. Interest in the properties and uses of water-based coatings, paints and inks has continued to grow since the establishment of the Clean Air Act of 1970. The present book is devoted to recent developments and trends in water-based coating and ink technology. This volume is divided in three broad categories: (1) Additives and Water-based Coating/Ink Systems, (2) Surface Modifications and Wettability, and (3) Ink/Coating Formulations and Their characterization. The role of various additives to improve the performance and properties of water-based coatings with special reference to surface phenomena such as wettability, adhesion, surface energies, dispersion stability, particle size and size distribution are presented in these sections.

This volume documents the proceedings of the International Symposium on Surface Phenomena and Additives in Water-Based Coatings and Printing Technology sponsored by the 21st Annual Meeting of the Fine Particle Society (FPS). This meeting was held in San Diego, California, August 21-25, 1990. The symposium upon which this volume is based was organized in four sessions emphasizing several basic and applied aspects of water-based coatings and printing technology. Major topics discussed include advances in water-based technology, water-based flexo and gravure inks, hydrophobically-modified cellulosic thickeners, organosilicones, uv curable silicone release coatings, surface characterization of TiO_2 pigments, polymer substrates, flexographic plates and coating films, pigment wetting and dispersing agents, hydrotrope effect in emulsion polymers, film thickness control, particle size measurements, rheological properties, and statistically designed mixtures for ink formulations.

Several processes occurring at molecular, microscopic and macroscopic levels in characterizing flow, levelling, defoaming, wetting and dispersing additives are described to minimize or eliminate the coating and printing defects. I hope that this book will serve its intended objective of summarizing various surface phenomena and additives in relation to water-based technology. In addition, it will be a valuable reference source for both novices and experts in the field of surface chemistry, chemical and environmental engineering, coating and printing processes, and water-based coatings, paints and ink formulation technology.

I would like to convey my sincere thanks and appreciation to Dr. Paul D. Berger, Organics Division, Witco Corporation, for his assistance and support in organizing the symposium. I wish to convey my thanks to the members of the Fine Particle Society for their cooperation and support that allowed me to invite many researchers from different countries to participate in the meeting. I also would like to thank the authors for their contributions, and the reviewers for their diligent and timely manuscript reviews. The views and conclusions expressed herein are those of the authors. Special thanks to Ms. Patricia M. Vann, Plenum Publishing Corporation for her continued interest in this project.

I would like to express my thanks to the appropriate management of the Eastman Chemical Company (ECC) for allowing me to participate in the organization of the symposium and to edit this proceedings volume. My special thanks are due to Mr. J. C. Martin, Mr. J. E. Dickert and Dr. G. J. O'Neill for their cooperation and understanding during the tenure of editing.

Last, but certainly not least, I am grateful to my colleagues and friends for their encouragement and assistance throughout this project. Also I would like to acknowledge the support, assistance and cooperation of my wife, Rama, in more ways than one, and extend the appreciation to my children (Amol and Anuj) for rendering home atmosphere conducive to work and for allowing me to spend many evenings and weekends working on this volume.

Mahendra K. Sharma

Kingsport, Tennessee

July 26, 1991

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