

**Polymer
Manufacturing
Technology and Health Effects**

Radian Corporation

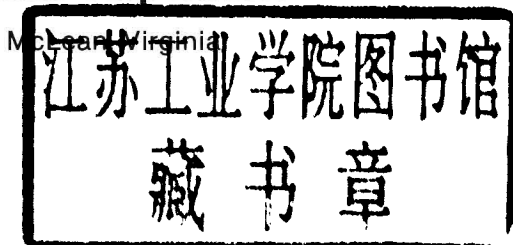
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POLYMER MANUFACTURING

Technology and Health Effects

by

Radian Corporation



NOYES DATA CORPORATION

Park Ridge, New Jersey, U.S.A.

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POLYMER MANUFACTURING

Foreword

This book is a detailed analysis of the polymer manufacturing industry. Elements of the analysis include an industry definition, raw materials, products and manufacturers, environmental impacts, and occupational health concerns.

Since their discovery and early use nearly 60 years ago, plastic products have evolved from a few materials that were typically considered to be cheap substitutes to a large group of products that can be processed to produce goods for a wide variety of applications. In some cases, plastic substitutes have virtually replaced the original products.

Raw materials for plastics and resins are industrial organic chemicals used as monomers or plasticizers and specialty chemicals used as additives to modify resin properties. The types of companies involved in plastics production vary, but the principal producers include major chemical, petroleum, paint, tire and rubber, steel, and electrical manufacturing companies.

Plastic and resin production processes generate air emissions, wastewater, and solid waste. Volatile emissions are generally highest in processing steps upstream of the reactor and in mass and solution polymerization monomer and solvent recovery steps. Suspension and emulsion polymerization processes typically generate more particulate emissions. The most significant source of wastewater in plastics production is the water used for emulsion and suspension polymerization. Wastewater may contain monomer, comonomer, additives, and fillers. Solid waste is generated from plastics production in one of two ways: polymer lost from the process (i.e., spills, routine cleaning, particulate collection) and by-product formation. Spent catalyst or additives also may constitute solid waste from some processes.

Some of the chemicals used as raw materials in plastics production are highly toxic and may produce serious adverse health effects in overexposed employees. However, effective engineering controls and personal protective equipment and clothing exist that greatly reduce worker exposure potential. Successful application of these controls depends on plant-specific factors such as plant design, materials handled, process configuration, and management and employee dedication to maintaining a good occupational health program.

This book is organized by types of polymers, and will be a valuable overview of the field.

The information in the book is from *Industrial Process Profiles for Environmental Use: The Plastics and Resins Production Industry*, prepared by Radian Corporation for the U.S. Environmental Protection Agency, July 1985.

The table of contents is organized in such a way as to serve as a subject index and provides easy access to the information contained in the book.

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