Contents

PREFACE, vii
ABOUT THE AUTHORS, xi

- 1 INTRODUCTION, 1
- 2 FUNDAMENTAL CONCEPTS IN ENGINEERING THERMODYNAMICS, 11
- 3 ORGANIC CHEMISTRY, 43
- 4 THE BIORENEWABLE RESOURCE BASE, 75
- **5** PRODUCTION OF BIORENEWABLE RESOURCES, 103
- 6 PRODUCTS FROM BIORENEWABLE RESOURCES, 137
- 7 BIOCHEMICAL PROCESSING OF CARBOHYDRATE-RICH BIOMASS, 171
- 8 THERMOCHEMICAL PROCESSING OF LIGNOCELLULOSIC BIOMASS, 195
- **9** PROCESSING OF OLEAGINOUS BIOMASS, 237
- PROCESSING OF BIORENEWABLE RESOURCES INTO NATURAL FIBERS, 251

Contents

- 11 ENVIRONMENTAL IMPACT OF THE BIOECONOMY, 261
- 12 ECONOMICS OF BIORENEWABLE RESOURCES, 287
- 13 BIORENEWABLE POLICY, 327

Appendix A DESCRIPTIONS OF BIORENEWABLE RESOURCES, 341

Appendix B conversion factors, 367

INDEX, 369