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Titolo	Protective Coatings : Film Formation and Properties // edited by Mei Wen, Karel Dušek
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Descrizione fisica	1 online resource (VIII, 510 p. 271 illus., 136 illus. in color.)
Disciplina	621.89 620.11223
Soggetti	Tribology Corrosion and anti-corrosives Coatings Materials science Materials—Surfaces Thin films Tribology, Corrosion and Coatings Characterization and Evaluation of Materials Surfaces and Interfaces, Thin Films
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Role of Distributions in Binders and Curatives and their Effect on Network Evolution and Structure -- Heterogeneity in Crosslinked Polymer Networks: Molecular Dynamics Simulations -- Rigidity Percolation Modeling of Modulus Development During Free-Radical Cross-linking Polymerization -- Rheology Measurement for Automotive Coatings -- Magnetic Microrheology for Characterization of Viscosity in Coatings -- CryoSEM: Revealing Microstructure Development in Drying Coatings -- Film Formation through Designed Diffusion Technology -- In-Situ FTIR Study of Cure Kinetics of Coatings with Controlled Humidity -- Shrinkage in UV Curable Coatings -- Measurements of Stress Development in Latex Coatings -- Stress Development in Reactive Coatings -- Swelling of Coating Films -- Chemical Depth Profiling of a Multilayered Coating System Using Slab Microtomy and

FTIR-ATR Analysis -- Characterization of Component Distributions in Acrylic Latex and Paint Films Containing an Alkali-Soluble Resin (ASR).
<advances in="" nanoscratch="" testing="" of="" automotive="" clearcoats -- scratch="" and="" mar="" resistance="" coatings -- appearance="" coatings -- craters="" other="" coatings="" defects="" mechanisms="" analysis -- degradation="" polymer="" service="" how="" properties="" deteriorate="" due="" to="" stochastic="" damage -- long-term="" mechanical="" durability="" coatings -- automotive="" paint="" application.

Sommario/riassunto

This book focuses on characterization of organic coatings by different testing methods and understanding of structure formation and materials properties. The knowledge of protective organic coatings and current test methods is based largely on empirical experience. This book aims at explaining the coating property changes during film drying and curing in terms of chemical and physical transformations. Current test methods are reviewed with emphasis on understanding their physical basis and expressing the test results in terms of comparable physical quantities. In general, this book provides readers a deeper understanding of the binder design, coating film formation process, properties build-up, appearance and defect formation, and automotive paint application. It also suggests manifold ways to improving the coatings performance. < This book is designed for coating professionals to gain deeper understanding of characterization techniques and to select the right ones to solve their coating problems. It is ideal for both experienced and early career scientists and engineers. Also, it is useful for graduate students in the general area of protective coatings. • Features a comprehensive list of techniques, characterizing coating films formation, their final properties and aging, as well as an in-depth discussion of each technique; • Maximizes understanding of testing methods and their physical background and provides correlations of characterization results with coatings structure or properties using detailed examples; • Describes special characterization techniques such as magnetic microrheology, in-situ infrared spectroscopy under controlled humidity, long-term in-situ stress measurement of coatings with capacitive sensors, and advanced nano-scratch testing; • Deepens understanding of spray of liquid coatings, drying, curing, network development and structural heterogeneity, modulus development, stress development, swelling of networks, scratch and mar resistance, coating appearance, defect formation, and durability; • Introduces modeling of cross-linking during film formation and build-up of film properties with the aim to predict the effects of changes of binder systems and film formation conditions.
