

1. Record Nr.	UNISA996397381203316
Titolo	By the King, a proclamation enjoyning the prosecution of all such persons as shall make or utter any farthings, half-pence, or pence of brass, or other base metals with private stamps [[electronic resource]]
Pubbl/distr/stampa	London, : Printed by the assigns of John Bill and Christopher Barker ..., 1674
Descrizione fisica	1 broadside
Altri autori (Persone)	Charles, King of England, <1630-1685.>
Soggetti	Counterfeits and counterfeiting - England Great Britain History Charles II, 1660-1685
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"Given at our court at Whitehall the fifth day of December, 1674, in the six and twentieth year of our reign." Reproduction of original in the Harvard University Library.
Sommario/riassunto	eebo-0062

2. Record Nr.	UNINA9911007097003321
Autore	Wang Meng-Jiao
Titolo	Rubber Reinforcement with Particulate Fillers / / Meng-Jiao Wang, Michael Morris
Pubbl/distr/stampa	Munich, : Hanser Chemical Industry Press Co., Ltd., : China, [2021] ©2021
ISBN	9781569907207
Descrizione fisica	1 online resource (610 pages)
Disciplina	678.3
Soggetti	Rubber goods Rubber - Reinforcement Filters (Materials)
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Preface -- About the Authors -- Contents -- 1 Manufacture of Fillers -- 1.1 Manufacture of Carbon Black -- 1.1.1 Mechanisms of Carbon Black Formation -- 1.1.2 Manufacturing Process of Carbon Black -- 1.1.2.1 Oil-Furnace Process -- 1.1.2.2 The Thermal Black Process -- 1.1.2.3 Acetylene Black Process -- 1.1.2.4 Lampblack Process -- 1.1.2.5 Impingement (Channel, Roller) Black Process -- 1.1.2.6 Recycle Blacks -- 1.1.2.7 Surface Modification of Carbon Blacks -- 1.1.2.7.1 Attachments of the Aromatic Ring Nucleus to Carbon Black -- 1.1.2.7.2 Attachments to the Aromatic Ring Structure through Oxidized Groups -- 1.1.2.7.3 Metal Oxide Treatment -- 1.2 Manufacture of Silica -- 1.2.1 Mechanisms of Precipitated Silica Formation -- 1.2.2 Manufacturing Process of Precipitated Silica -- 1.2.3 Mechanisms of Fumed Silica Formation -- 1.2.4 Manufacture Process of Fumed Silica -- References -- 2 Characterization of Fillers -- 2.1 Chemical Composition -- 2.1.1 Carbon Black -- 2.1.2 Silica -- 2.2 Micro-Structure of Fillers -- 2.2.1 Carbon Black -- 2.2.2 Silica -- 2.3 Filler Morphologies -- 2.3.1 Primary Particles - Surface Area -- 2.3.1.1 Transmission Electron Microscope (TEM) -- 2.3.1.2 Gas Phase Adsorptions -- 2.3.1.2.1 Total Surface Area Measured by Nitrogen

Adsorption - BET/NSA -- 2.3.1.2.2 External Surface Area Measured by Nitrogen Adsorption STSA -- 2.3.1.2.3 Micro-Pore Size Distribution Measured by Nitrogen Adsorption -- 2.3.1.3 Liquid Phase Adsorptions -- 2.3.1.3.1 Iodine Adsorptions -- 2.3.1.3.2 Adsorption of Large Molecules -- 2.3.2 Structure - Aggregate Size and Shape -- 2.3.2.1 Transmission Electron Microscopy -- 2.3.2.2 Disc Centrifuge Photosedimentometer -- 2.3.2.3 Void Volume Measurement -- 2.3.2.3.1 Oil Absorption -- 2.3.2.3.2 Compressed Volume -- 2.3.2.3.2.1 Relation between Compressibility and Pressure 2.3.2.3.2.2 Mechanism of Compression -- 2.3.2.3.3 Mercury Porosimetry -- 2.3.3 Tinting Strength -- 2.4 Filler Surface Characteristics -- 2.4.1 Characterization of Surface Chemistry of Filler-Surface Groups -- 2.4.2 Characterization of Physical Chemistry of Filler Surface-Surface Energy -- 2.4.2.1 Contact Angle -- 2.4.2.1.1 Single Liquid Phase -- 2.4.2.1.2 Dual Liquid Phases -- 2.4.2.2 Heat of Immersion -- 2.4.2.3 Inverse Gas Chromatograph -- 2.4.2.3.1 Principle of Measuring Filler Surface Energy with IGC -- 2.4.2.3.2 Adsorption at Infinite Dilution -- 2.4.2.3.3 Adsorption at Finite Concentration -- 2.4.2.3.4 Surface Energy of the Fillers -- 2.4.2.3.4.1 Dispersive Component of Filler Surface Energy -- 2.4.2.3.4.2 Specific Component of Filler Surface Energy -- 2.4.2.3.4.3 Sf Value -- 2.4.2.3.4.4 Energy Heterogeneity of Filler Surfaces -- 2.4.2.3.4.5 Surface Energy of Silane-Modified Silicas -- 2.4.2.3.5 Estimation of Rubber-Filler Interaction from Adsorption Energy of Elastomer Analogs -- 2.4.2.4 Bound Rubber Measurement -- References -- 3 Effect of Fillers in Rubber -- 3.1 Hydrodynamic Effect Strain Amplification -- 3.2 Interfacial Interaction between Filler and Polymer -- 3.2.1 Bound Rubber -- 3.2.2 Rubber Shell -- 3.3 Occlusion of Rubber -- 3.4 Filler Agglomeration -- 3.4.1 Observations of Filler Agglomeration -- 3.4.2 Modes of Filler Agglomeration -- 3.4.3 Thermodynamics of Filler Agglomeration -- 3.4.4 Kinetics of Filler Agglomeration -- References -- 4 Filler Dispersion -- 4.1 Basic Concept of Filler Dispersion -- 4.2 Parameters Influencing Filler Dispersion -- 4.3 Liquid Phase Mixing -- References -- 5 Effect of Fillers on the Properties of Uncured Compounds -- 5.1 Bound Rubber -- 5.1.1 Significance of Bound Rubber -- 5.1.2 Measurement of Bound Rubber -- 5.1.3 Nature of Bound Rubber Attachment -- 5.1.4 Polymer Mobility in Bound Rubber 5.1.5 Polymer Effects on Bound Rubber -- 5.1.5.1 Molecular Weight Effects -- 5.1.5.2 Polymer Chemistry Effects -- 5.1.6 Effect of Filler on Bound Rubber -- 5.1.6.1 Surface Area and Structure -- 5.1.6.2 Specific Surface Activity of Carbon Blacks -- 5.1.6.3 Effect of Surface Characteristics on Bound Rubber -- 5.1.6.4 Carbon Black Surface Modification -- 5.1.6.5 Silica Surface Modification -- 5.1.7 Effect of Mixing Conditions on Bound Rubber -- 5.1.7.1 Temperature and Time of Mixing -- 5.1.7.2 Mixing Sequence Effect of Rubber Ingredients -- 5.1.7.2.1 Mixing Sequence of Oil and Other Additives -- 5.1.7.2.2 Mixing Sequence of Sulfur, Sulfur Donor, and Other Crosslinkers -- 5.1.7.2.3 Bound Rubber of Silica Compounds -- 5.1.7.3 Bound Rubber in Wet Masterbatches -- 5.1.7.4 Bound Rubber of Fumed Silica-Filled Silicone Rubber -- 5.2 Viscosity of Filled Compounds -- 5.2.1 Factors Influencing Viscosity of the Carbon Black-Filled Compounds -- 5.2.2 Master Curve of Viscosity vs. Effective Volume of Carbon Blacks -- 5.2.3 Viscosity of Silica Compounds -- 5.2.4 Viscosity Growth - Storage Hardening -- 5.3 Die Swell and Surface Appearance of the Extrudate -- 5.3.1 Die Swell of Carbon Black Compounds -- 5.3.2 Die Swell of Silica Compounds -- 5.3.3 Extrudate Appearance -- 5.4 Green Strength -- 5.4.1 Effect of Polymers -- 5.4.2 Effect of Filler Properties -- References -- 6 Effect of Fillers on the Properties of Vulcanizates --

6.1 Swelling -- 6.2 Stress-Strain Behavior -- 6.2.1 Low Strain -- 6.2.2 Hardness -- 6.2.3 Medium and High Strains-The Strain Dependence of Modulus -- 6.3 Strain-Energy Loss-Stress-Softening Effect -- 6.3.1 Mechanisms of Stress-Softening Effect -- 6.3.1.1 Gum -- 6.3.1.2 Filled Vulcanizates -- 6.3.1.3 Recovery of Stress Softening -- 6.3.2 Effect of Fillers on Stress Softening -- 6.3.2.1 Carbon Blacks -- 6.3.2.1.1 Effect of Loading -- 6.3.2.1.2 Effect of Surface Area -- 6.3.2.1.3 Effect of Structure -- 6.3.2.2 Precipitated Silica -- 6.4 Fracture Properties -- 6.4.1 Crack Initiation -- 6.4.2 Tearing -- 6.4.2.1 State of Tearing -- 6.4.2.1.1 Effect of Filler -- 6.4.2.1.2 Effect of Polymer Crystallizability and Network Structure -- 6.4.2.1.2.1 Non-Crystallizable Rubber-SBR -- 6.4.2.1.2.2 Crystallizable Rubber-NR -- 6.4.2.2 Tearing Energy -- 6.4.2.2.1 Effect of Filler -- 6.4.2.2.2 Effect of Polymer Crystallizability and Network Structure -- 6.4.2.2.2.1 Non-Crystallizable Rubber-SBR -- 6.4.2.2.2.2 Crystallizable Rubber-NR -- 6.4.3 Tensile Strength and Elongation at Break -- 6.4.4 Fatigue -- References -- 7 Effect of Fillers on the Dynamic Properties of Vulcanizates -- 7.1 Dynamic Properties of Vulcanizates -- 7.2 Dynamic Properties of Filled Vulcanizates -- 7.2.1 Strain Amplitude Dependence of Elastic Modulus of Filled Rubber -- 7.2.2 Strain Amplitude Dependence of Viscous Modulus of Filled Rubber -- 7.2.3 Strain Amplitude Dependence of Loss Tangent of Filled Rubber -- 7.2.4 Hysteresis Mechanisms of Filled Rubber Concerning Different Modes of Filler Agglomeration -- 7.2.5 Temperature Dependence of Dynamic Properties of Filled Vulcanizates -- 7.3 Dynamic Stress Softening Effect -- 7.3.1 Stress-Softening Effect of Filled Rubbers Measured with Mode 2 -- 7.3.2 Effect of Temperature on Dynamic Stress-Softening -- 7.3.3 Effect of Frequency on Dynamic Stress-Softening -- 7.3.4 Stress-Softening Effect of Filled Rubbers Measured with Mode 3 -- 7.3.5 Effect of Filler Characteristics on Dynamic Stress-Softening and Hysteresis -- 7.3.6 Dynamic Stress-Softening of Silica Compounds Produced by Liquid Phase Mixing -- 7.4 Time-Temperature Superposition of Dynamic Properties of Filled Vulcanizates -- 7.5 Heat Build-up -- 7.6 Resilience -- References -- 8 Rubber Reinforcement Related to Tire Performance -- 8.1 Rolling Resistance -- 8.1.1 Mechanisms of Rolling Resistance Relationship between Rolling Resistance and Hysteresis -- 8.1.2 Effect of Filler on Temperature Dependence of Dynamic Properties -- 8.1.2.1 Effect of Filler Loading -- 8.1.2.2 Effect of Filler Morphology -- 8.1.2.2.1 Effect of Surface Area -- 8.1.2.2.2 Effect of Structure -- 8.1.2.3 Effect of Filler Surface Characteristics -- 8.1.2.3.1 Effect of Carbon Black Graphitization on Dynamic Properties -- 8.1.2.3.2 Comparison of Carbon Black and Silica -- 8.1.2.3.3 Effect of Filler Blends (Blend of Silica and Carbon Black, without Coupling Agent) -- 8.1.2.3.4 Effect of Surface Modification of Silica -- 8.1.2.3.5 Effect of Surface Modification of Carbon Black on Dynamic Properties -- 8.1.2.3.6 Carbon/Silica Dual Phase Filler -- 8.1.2.3.7 Polymeric Filler -- 8.1.3 Mixing Effect -- 8.1.4 Precrosslinking Effect -- 8.2 Skid Resistance Friction -- 8.2.1 Mechanisms of Skid Resistance -- 8.2.1.1 Friction and Friction Coefficients - Static Friction and Dynamic Friction -- 8.2.1.2 Friction between Two Rigid Solid Surfaces -- 8.2.2 Friction of Rubber on Rigid Surface -- 8.2.2.1 Dry Friction -- 8.2.2.1.1 Adhesion Friction -- 8.2.2.1.2 Hysteresis Friction -- 8.2.2.2 Wet Friction -- 8.2.2.2.1 Elastohydrodynamic Lubrication -- 8.2.2.2.2 The Thickness of Lubricant Film for Rubber Sliding over Rigid Asperity -- 8.2.2.2.3 Boundary Lubrication -- 8.2.2.2.4 Difference in Boundary Lubrication between Rigid-Rigid and Rigid-Elastomer Surfaces -- 8.2.2.3 Review of Frictional Properties of Some Tire Tread Materials --

8.2.2.3.1 Carbon and Graphite -- 8.2.2.3.2 Glass -- 8.2.2.3.3 Rubber
-- 8.2.2.3.4 Prediction of Friction of Filled Rubbers on Dry and Wet
Road Surfaces Based on Surface Characteristics of Different Materials --
8.2.2.4 Morphology of the Worn Surface of Filled Vulcanizates
8.2.2.4.1 Comparison of Polymer-Filler Interaction between Carbon
Black and Silica

Sommario/riassunto

"In the rubber industry, one of the most widely practiced processes is the reinforcement of rubber by particulate fillers, especially carbon black and silica. This process is of such importance that more than 99% of rubber products contain fillers, and the research and development of fillers have become the most widely researched area in rubber science and technology. This book covers the most important theoretical and practical aspects of rubber reinforcement, such as filler basic properties and their characterization methods, the effect of fillers in polymers, the processability of compounds, and the properties of filled vulcanizates. Special chapters deal with applications of fillers in tires and industrial rubber goods and the reinforcement of silicone rubbers. Testing methods and their principles, applications, and limitations are reviewed, with emphasis on the surface activity, widely accepted as the "third dimension" of filler characterization, after particle size and structure. This has not been described in depth in other books on rubber reinforcement. The effects of fillers on rubber and their mechanisms, which are important links between filler properties and the performance of rubber goods, are explained. A guide for selecting the most appropriate reinforcing systems for specific applications is provided, taking into account processabilities and properties of filled compounds and performance of rubber products. With solutions to many practical problems related to rubber research and compounding, this book serves as a valuable companion to engineers and product developers in the rubber industry, material scientists, and teachers and students in material science and rubber courses"-- Provided by publisher
